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Vol. 979 Number 4

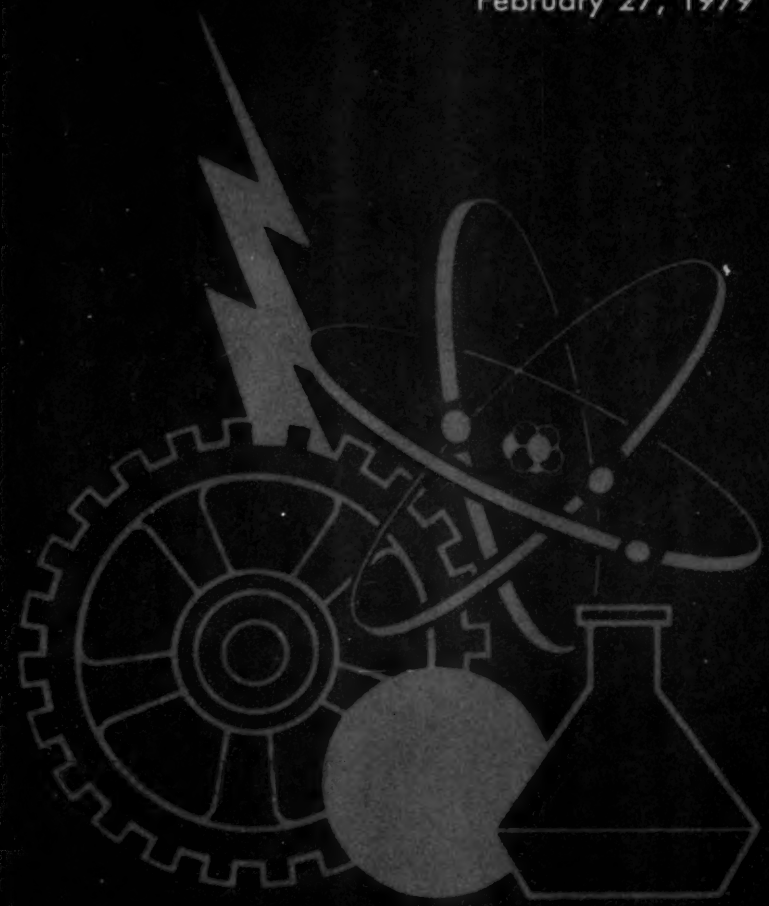
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 27, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

February 27, 1979 Volume 979 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Availability of Consolidated Listing

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," which appeared in the OFFICIAL GAZETTE of January 2, 1979, is available, as a separate publication, from the Superintendent of Documents, Washington, D.C. 20402. Please include the following information when ordering. Stock No. 003–004–00558–1, cost $3.00.

RICHARD J. SHAKMAN,
Jan. 29, 1979. *Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290 ; Patent Act of 1952

3,467,427, E. J. Brooks Company, ALL-PLASTIC SEAL ; **4,001,919,** same, SEAL ; **D. 238,149,** same, SECURITY SEAL FOR A MAILBAG OR THE LIKE, **filed** Sept. 7, 1977, D.C.N.J. (Newark), Doc. C–77–1857, *E. J. Brooks Company* v. *United States Postal Service.* Order of dismissal filed Aug. 2, 1978.

3,689,921, Kustom Electronics, Inc., METHOD AND APPARATUS FOR DIGITALLY DETERMINING THE SPEED OF A MOVING OBJECT ; **3,936,824,** same, METHOD AND APPARATUS FOR DIGITALLY MEASURING SPEED, **filed** Apr. 8, 1976, D.C. Colo. (Denver), Doc. 76–382, *Kustom Electronics, Inc.* v. *CMI Inc. and Jack D. Fritzlen.* Judgment entered in favor of plaintiff. All counterclaims of defendants dismissed with prejudice. Entered Mar. 9, 1978.

3,792,133, A. C. Aukerman Co., METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION ; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS ; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** June 6, 1977, D.C., N.D. Iowa (Sioux City), Doc. C–77–4038, *Gomaco Corporation* v. *A. C. Aukerman Co.* Transferred to U.S. District Court for Northern District of Georgia on Jan. 13, 1978.

3,807,178, Pacific Pollution Control, FLOATING BOOM ; **3,807,617,** same, FLOATING BOOM DEPLOYMENT APPARATUS ; **3,922,860,** same, FLOATING BOOM HAVING ROTATABLE FLOAT ELEMENTS ; **4,003,206,** same, UNIVERSAL END CONNECTOR FOR FLOATING BOOM, **filed** May 5, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–0968WAI, *Albany International Corp. et al.* v. *Oil Spill Containment Corp. et al.*

3,807,617. (See 3,807,178.)

3,823,388, Norand Corporation, DATA COLLECTION AND UTILIZATION SYSTEM ; **3,991,299,** same, BAR CODE SCANNER, **filed** Jan. 11, 1978, D.C. Iowa (Cedar Rapids), Doc. C78–7, *Telxon Corporation* v. *Norand Corporation.*

3,885,932, Super Products Corporation, DUST FILTRATION SYSTEM ; **3,973,935,** same, **filed** May 10, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–285, *Super Products Corporation* v. *Myers-Sherman Company.* Case transferred to the Northern District of Illinois (Chicago), on Aug. 2, 1978.

3,899,791, Slidemagic System, Inc., PHOTOGRAPHIC POSITIONING AND ALIGNING GRID, **filed** Feb. 14, 1978, D.C.N.J. (Newark), Doc. C78–274, *Slidemagic System, Inc.* v. *Oxberry.* Order dismissing the action filed Dec. 7, 1978.

3,906,625, Allway Tools, Inc., CUTTING IMPLEMENT ; **4,005,525,** same, RETRACTABLE CUTTING IMPLEMENT, **filed** Oct. 18, 1978, D.C., S.D. Tex. (Houston), Doc. CA–H–78–2007, *Allway Tools Inc.* v. *American Safety Razor Co.*

3,912,255, Pennsylvania Research Associates, Inc., STACKERS FOR DOCUMENT COUNTERS AND THE LIKE, **filed** June 27, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2573, *Brandt-Pra, Inc.* v. *Cummins-Allison Corp.*

3,922,860. (See 3,807,178.)

3,925,751, Sundstrand Data Control, Inc., GLIDE SLOPE WARNING SYSTEM WITH A VARIABLE WARNING RATE ; **3,934,221,** same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING ; **3,936,796,** same, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT ; **3,946,358,** same, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT ; **3,947,808,** same, EXCESSIVE DESCENT RATE WARNING SYSTEM FOR AIRCRAFT ; **3,947,810,** same, NEGATIVE CLIMB RATE AFTER TAKE-OFF WARNING SYSTEM WITH PREDETERMINED LOSS OF ALTITUDE INHIBIT ; **3,958,219,** same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL, **filed** Nov. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4123, *Sundstrand Data Control, Inc.* v. *Collins Radio Company.* Transferred to Western District of Washington (Seattle), on Feb. 1, 1978.

3,925,751, Sundstrand Data Control, Inc., GLIDE SLOPE WARNING SYSTEM WITH A VARIABLE WARNING RATE ; **3,934,221,** same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING ; **3,936,796,** same, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT ; **3,946,358,** same, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT ; **3,947,808,** same, EXCESSIVE DESCENT RATE WARNING SYSTEM FOR AIRCRAFT ; **3,947,809,** same, BELOW GLIDE SLOPE ADVISORY WARNING SYSTEM FOR AIRCRAFT ; **3,947,810,** same, NEGATIVE CLIMB RATE AFTER TAKE-OFF WARNING SYSTEM WITH PREDETERMINED LOSS OF ALTITUDE INHIBIT ; **3,958,219,** same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL, **filed** June 27, 1977, D.C., N.D. Iowa (Cedar Rapids), Doc. C–77–44, *Rockwell International Corporation et al.* v. *Sundstrand Data Control, Inc.*

3,926,906, Johnson & Johnson, DENTAL FILLING PACKAGE, **filed** Feb. 4, 1976, D.C.N.J. (Trenton), Doc. C76–229, *Johnson & Johnson* v. *Pennwalt Corp.* Stipulation of dismissal filed June 8, 1978. **Same, filed** Feb. 4, 1976, D.C.N.J. (Trenton), Doc. C76–230, *Johnson & Johnson* v. *Minnesota Mining & Manufacturing Company.*

3,934,221. (See 3,925,751.)

3,936,796. (See 3,925,751.)

3,936,824. (See 3,689,921.)

3,937,812, Pitman-Moore, Inc. FELINE CALICIVIRUS VACCINE AND PRODUCTION THEREOF ; **3,944,469,** same, **filed** Mar. 3, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–132, *Pitman-Moore, Inc.* v. *Fromm Laboratories, Inc.*

3,942,624, Union Carbide Corporation, CANTILEVERED BELTED BAG LOADING APPARATUS AND METHOD ; **4,081,056,** same, CANTILEVERED BELTED BAG LOADING METHOD, **filed** Aug. 21, 1978, D.C., W.D. Mo. (Kansas City), Doc. 78–0625–CV–W–4, *Union Carbide Corporation* v. *RMF Steel Products Co.*

3,944,469. (See 3,937,812.)

3,946,358. (See 3,925,751.)

3,947,808. (See 3,925,751.)

3,947,809. (See 3,925,751.)

3,947,810. (See 3,925,751.)

3,949,527, Canamer Leasing Services, Inc., MATERIAL SUPPORTED COVER AND METHOD FOR SECURING SAID COVER TO THE GROUND, **filed** May 16, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1925, *Canamer Leasing Services, Inc.* v. *Richard W. Rayner, Jr., doing business as Rayner Coverings Services.*

3,954,145, Glenn Nesbit, DRIVE ARRANGEMENT FOR MOTORCYCLES AND THE LIKE, **filed** Feb. 1, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–0380–RMT, *Glenn Nesbit and Phase 3 Corporation* v. *B & S Cycle Products, et al.* **Same, filed** Oct. 6, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–3848–RJK (SX), *Glenn S. Nesbit, et al.* v. *Primo Products, Inc., et al.*

3,957,465. (See 3,792,133.)

3,958,219. (See 3,925,751.)

3,960,006, Alco Standard Corporation, NON-DESTRUCTIVE TEST APPARATUS AND METHOD FOR A MATERIAL HAVING A CAVITY THEREIN, **filed** Aug. 30, 1977, D.C., W.D. Tenn. (Memphis), Doc. C-77-2513, *Alco Standard Corporation* v. *Tennessee Valley Authority and Westinghouse Electric Corp.*

3,961,454, Howard C. Adams, PREFABRICATED INSULATION PANEL, **filed** Dec. 22, 1976, D.C., M.D. Fla. (Tampa), Doc. 76-1003-C T.H., *Howard C. Adams et al.* v. *Anco Incorporated.*

3,962,897, Columbiana Foundry Co., METAL WORKING APPARATUS AND METHODS OF PIERCING; **4,034,588,** same, METHODS OF PIERCING AND ENLARGING ELONGATE METAL MEMBERS SUCH AS SEAMLESS TUBES, **filed** July 17, 1978, D.C., W.D. Pa. (Pittsburgh), Doc. 78-778, *Columbiana Foundry Company* v. *Brighton Electric Steel Casting Co.*

3,973,935. (See 3,885,932.)

3,984,965, Harry Crisci, DEVICE FOR APPLYING CAPS TO BOTTLES, **filed** Oct. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3996, *Northern Engineering & Plastics Corp. et al.* v. *Blackhawk Molding Company, Inc.*

3,988,431, Becton, Dickinson & Co., RADIOASSAY OF FOLATES; **4,028,465,** Bio-Rad Laboratories, Inc. ASSAY METHOD FOR SERUM FOLATE, **filed** Mar. 10, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-548 CBR, *Bio-Rad Laboratories, Inc.* v. *Becton, Dickinson & Co.*

3,991,299. (See 3,823,388.)

3,991,831, Lee Blacksmith, Inc., COMBINATION POST-PLOWING CULTIVATING IMPLEMENT AND FIELD DRAG, **filed** June 14, 1977, D.C., S.D. Ill. (Peoria), Doc. 77-1055, *Lee Blacksmith, Inc.* v. *Chromalloy American Corp.*

3,994,240, Proform, Inc., COIL CAR COVER, **filed** May 10, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1640, *Proform, Inc.* v. *Choo-Choo Products Ltd.* Defendant et al. permanently enjoined and restrained from infringing plaintiff's patent. No damages are awarded to plaintiff and each party will bear its own costs. Entered Oct. 4, 1978.

3,999,411, Telkee, Inc., LOCK KNOB CONTROL MECHANISM, **filed** June 28, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2318, *Telkee, Inc. through its unincorporated division, Folger Adam Co.* v. *Brink's Locking Systems et al.*

3,999,748, William A. Clarke, CHILDRENS' GAME OF CATCH; **4,029,316,** same, GAME BALL, **filed** Sept. 27, 1977, D.C., W.D. Pa. (Erie), Doc. 77-132, *William A. Clarke* v. *K-Mart.* **Same, filed** Oct. 5, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3702, *Glovemakers, Inc.* v. *Wisconsin Toy & Novelty Co., Inc.* Cause and case dismissed pursuant to Rule 41(a)(1) on Feb. 15, 1978. **Same, filed** Oct. 20, 1977, D.C., W.D. Pa. (Erie), Doc. 77-147, *William A. Clarke* v. *F. M. Woolworth Company.* **Same, filed** Oct. 11, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3754, *Glovemakers, Inc.* v. *Harben Company.* By stipulation of the parties, it is ordered with prejudice and costs to stand as paid. Entered Jan. 13, 1978.

4,000,620, Merle M. Burge, GRAVITATIONAL IRRIGATION SYSTEM AND METHOD OF INSTALLING, **filed** Feb. 23, 1977, D.C. N. Dak. (Bismarck), Doc. A77-1015, *Blumhardt Manufacturing, Inc.* v. *Nu-Flex Irrigation, Inc. and Merle M. Burge.* Memorandum and order granting motion to dismiss for lack of personal jurisdiction entered Oct. 5, 1977.

4,001,919. (See 3,467,427.)

4,003,206. (See 3,807,178.)

4,004,129, Auto-Bake Pty. Limited, FOOD PROCESSING OVEN, **filed** Dec. 8, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77-C-2413, *Auto-Bake Pty. Limited* v. *Universal Oven Co.*

4,005,525. (See 3,906,625.)

4,014,633. (See 3,792,133.)

4,017,168, Garrett W. Brown, EQUIPMENT FOR USE WITH HAND HELD MOTION PICTURE CAMERAS, **filed** Apr. 14, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-1327-IH, *Garrett W. Brown, etc. et al.* v. *Panavision, Incorporated, etc. et al.*

4,024,468, White's Electronics, Inc., INDUCTION BALANCE METAL DETECTOR WITH INVERSE DISCRIMINATION; **4,030,026,** same, SAMPLING METAL DETECTOR, **filed** Sept. 9, 1977, D.C. Oreg. (Portland), Doc. 77-709, *Garrett Electronics, Inc.* v. *White's Electronics, Inc.*

4,025,756, Western Stamping Corporation, TOY CASH REGISTER, **filed** Apr. 22, 1977, D.C., E.D. Mich. (Detroit), Doc. 77-70981, *Western Stamping Corporation* v. *Toys R Us, Inc. and Durham Industries, Inc.* Defendant et al. are hereby enjoined and restrained from directly or indirectly making, using or selling any toy cash register which is an infringment of said patent. Entered Apr. 21, 1978.

4,028,465. (See 3,988,431.)

4,029,316. (See 3,999,748.)

4,030,026. (See 4,024,468.)

4,030,508, Viatron Medical B.V., LOW OUTPUT ELECTRODE FOR CARDIAC PACING, **filed** Dec. 8, 1978, D.C. Mass. (Boston), Doc. 78-3194-MA, *Viatron Medical B.V. and Viatron Medical, Inc.* v. *Medtronic, Inc.*

4,034,588. (See 3,962,897.)

4,037,006, Frank William Roberts et al. COMPOSITE PANELBOARD AND METHOD OF MAKING SAME; **4,052,831,** same, PANEL BUILDING CONSTRUCTION AND METHOD, AND CLIP THEREFOR, **filed** July 6, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3-78-0832-G, *Rmax, Inc.* v. *Panel Era Manufacturing Corporation et al.*

4,052,831. (See 4,037,006.)

4,058,344, Kirk Dyson Designs Limited, GROUND ENGAGING MEMBER FOR MOVABLE STRUCTURES, **filed** June, 19, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2447, *Kirk Dyson Designs Limited* v. *Ballbarrow Corp. et al.*

4,061,513, Carl G. Danielson, WRAPPING APPARATUS FOR PIPELINE JOINTS, **filed** June 14, 1978, D.C., S.D. Tex. (Houston), Doc. CA H-78-1085, *Pipe Wrap Supply, Inc.* v. *Royston Laboratories, Inc.*

4,074,176, Marine Electric Corporation, MOTOR PROTECTOR, **filed** May 17, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1947, *Marine Electric Corporation* v. *Vapor Corporation.*

4,081,656. (See 3,942,624.)

4,090,685, Westinghouse Air Brake Company, GRADE CROSSING ASSEMBLY, **filed** Aug. 28, 1978, D.C., W.D. Pa. (Pittsburgh), Doc. 78-950, *Fafetran Systems Corp.* v. *Westinghouse Air Brake Co.*

4,090,878, Hancock Laboratories, Inc., ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR IMPLANTATION, **filed** May 23, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2025, *Hancock Laboratories, Inc.* v. *American Hospital Supply.*

4,095,842, Cool Curtain, Inc., PLASTIC STRIP DOOR, **filed** July 6, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78-2565-R, *Cool Curtain* v. *Johnston Environmental Corp.*

4,098,407, Lumber Systems, Inc., LUMBER SORTING APPARATUS, **filed** Dec. 7, 1978, D.C., W.D. Ark. (Hot Springs), Doc. 78-6049, *Harvey Engineering and Manufacturing Corporation* v. *Lumber Systems, Inc.*

Re. 26,427, Space Recovery Research Center, Inc., MULTICELL WING TYPE AERIAL DEVICE, **filed** July 31, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78-2961-R, *Domina C. Jalbert* v. *James Handbury, doing business as Free Flight Enterprises.*

Re. 26,667, Wayne-Gossard Corporation, FOOT COVER AND METHOD OF MANUFACTURING THE SAME, **filed** Feb. 5, 1974, D.C., E.D. Pa. (Philadelphia), Doc. 74-288, *Wayne-Gossard Corporation* v. *Sondra Manufacturing Co.* Defendants et al. are hereby restrained and enjoined, directly or indirectly from manufacturing, etc. Sondra foot socks, styles 40 and 50, or any other foot covers embodying invention claimed in Claims 4 and 5 of Re. 26,667. Entered July 28, 1977.

D. 263,251, A & B Instrument Company, Inc., CONTOUR PILLOW OR THE LIKE, **filed** Jan. 28, 1974, D.C., W.D. Okla. (Oklahoma City), Doc. 74-111-C, *A & B Instrument Company, Inc. and Mid-America Sales and Marketing, Inc.* v. *Sears, Roebuck & Company.* Pursuant to stipulation of parties, plaintiff's action is dismissed with prejudice, with each party bearing its own costs. Entered Oct. 30, 1978.

D. 238,149. (See 3,467,427.)

P.P. 3,723, Benjamin Y. Kamada, POMEGRANATE TREE **filed** Dec. 12, 1978, D.C., E.D. Calif. (Fresno), Doc. F-78-239-C, *Benjamin Y. Kamada* v. *Steve Bakalian.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,743,432, Re. S.N. 955,008, Filed Oct. 26, 1978, Cl. 404/84, AUTOMATED PAVING MACHINE, Billy R. Lee, Owner of Record: *Lee-Boy Manufacturing, Charlotte, N.C.,* Attorney or Agent: Floyd A. Gibson, Ex. Gp.: 351

3,879,188, Re. S.N. 969,711, Filed Dec. 15, 1978, Cl. 71/86, GROWTH REGULATION PROCESS, Charles D. Fritz, et al., Owner of Record: *Amchem Products, Inc., Ambler, Pa.,* Attorney or Agent: Robert C. Brown, et al., Ex. Gp.: 124

3,991,924, Re. S.N. 969,443, Filed Dec. 14, 1978, Cl. 225/100, BURSTER MECHANISM, Marlin A. Schueler, Owner of Record: *American/Durein Co., Oakland, Calif.,* Attorney or Agent: Bruce H. Johnsonbaugh, et al., Ex. Gp.: 323

3,995,355, Re. S.N. 966,740, Filed Dec. 5, 1978, Cl. 29/157 R, LAYING OF FLEXIBLE PIPE, Robert C. Sneed, et al., Owner of Record: *Fas-Line Sales & Rentals, Inc., Odessa, Tex.,* Attorney or Agent: Ronald G. Bliss, et al., Ex. Gp.: 321

3,998,230, Re. S.N. 966,962, Filed Dec. 6, 1978, Cl. 128/330, HAIR TRANSPLANT PROCESS AND FILAMENT, Paul W. Miller, Owner of Record: *Hairgenics International Inc., Hamilton, Bermuda,* Attorney or Agent: Robert B. Kennedy, Ex. Gp.: 335

4,065,562, Re. S.N. 969,785, Filed Dec. 15, 1978, Cl. 424/297, METHOD AND COMPOSITION FOR REDUCING BLOOD GLUCOSE LEVELS, Katsuya Ohata, et al., Owner of Record: *Nippon Shinyaku Co. Ltd., Kyoto, Japan,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 125

4,114,999, Re. S.N. 967,775, Filed Dec. 8, 1978, Cl. 355/10, APPARATUS FOR MAKING PLATES FOR PRINTING, Masahiro Kogiso, et al., Owner of Record: *Iwatsu Electric Co. Ltd., Tokyo, Japan,* Attorney or Agent: Henry N. Paul, Jr., et al., Ex. Gp.: 212

PATENT NOTICES

Certificates of Correction for the Week of Feb. 27, 1979

Re. 29,801	4,091,748	4,103,026	4,116,557
Re. 29,802	4,092,391	4,103,058	4,116,613
D. 245,411	4,092,399	4,103,172	4,116,646
3,551,564	4,092,461	4,104,394	4,116,669
3,564,384	4,092,552	4,104,642	4,117,405
3,887,194	4,092,681	4,104,860	4,117,778
3,898,231	4,093,100	4,104,923	4,118,056
3,930,903	4,093,562	4,105,303	4,118,316
3,936,956	4,094,368	4,105,343	4,118,976
3,998,790	4,094,462	4,105,439	4,119,403
4,031,122	4,094,665	4,105,643	4,120,474
4,039,522	4,094,721	4,106,043	4,120,572
4,058,478	4,094,787	4,106,109	4,120,660
4,060,770	4,094,965	4,106,170	4,120,661
4,063,146	4,095,760	4,106,386	4,121,038
4,068,027	4,096,052	4,106,506	4,121,269
4,069,473	4,096,192	4,106,528	4,121,742
4,073,487	4,096,236	4,106,618	4,122,274
4,075,036	4,096,375	4,106,967	4,122,512
4,077,003	4,096,697	4,107,216	4,123,075
4,077,988	4,097,107	4,107,226	4,123,084
4,080,450	4,097,573	4,107,276	4,123,251
4,080,967	4,098,330	4,107,675	4,123,458
4,082,884	4,098,635	4,107,680	4,123,460
4,084,640	4,099,230	4,107,710	4,123,520
4,084,972	4,099,381	4,108,249	4,123,673
4,085,090	4,099,595	4,108,389	4,124,041
4,085,680	4,100,121	4,108,902	4,124,610
4,086,352	4,100,821	4,112,797	4,124,612
4,086,759	4,100,927	4,113,069	4,124,769
4,088,141	4,101,203	4,113,566	4,125,218
4,089,789	4,101,514	4,113,968	4,125,547
4,089,817	4,101,635	4,114,201	4,125,581
4,090,257	4,101,866	4,114,771	4,126,152
4,090,792	4,101,929	4,115,106	4,126,333
4,090,873	4,102,429	4,115,985	4,126,398
4,091,095	4,102,586	4,116,396	4,126,447
4,091,330	4,102,898	4,116,461	
4,091,488	4,102,900	4,116,518	

Disclaimers

3,408,496.—*Francis B. Sellers,* Sudbury, and *Charles A. Ziegler,* Saxonville, Mass. ALPHA RAY EXCITED COMPOSITION ANALYSIS. Patent dated Oct. 29, 1968. Disclaimer filed Jan. 3, 1979, by the assignee, *Panametrics, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,566,982.—*Jacob Henry Share,* Abertson, N.Y., and *Stanley Share,* Ormand Beach, and *Seymour Joseph Share,* Daytona Beach, Fla. WELL POINT SYSTEM. Patent dated Mar. 2, 1971. Disclaimer filed Nov. 1, 1978, by the assignee, *Stanley-Jackson Corp.*

Hereby enters this disclaimer to claim 9 of said patent.

3,588,837.—*Ross D. Rash,* Bloomington, *Duane H. Anderson,* St. Paul, *Hilding E. Nelson,* Scandia, and *Paul D. Byrne,* Stillwater, Minn. SYSTEMS ACTIVITY MONITOR. Patent dated June 28, 1971. Disclaimer filed Dec. 1, 1978, by the assignee, *Comten, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

3,832,815.—*Joseph K. Balaz,* Northbrook, *Richard A. Kelly,* Prospect Heights, and *Wolfgang Schulze,* Buffalo Grove, Ill. MODULAR INSULATION OF FIBROUS MATERIAL. Patent dated Sept. 3, 1974. Disclaimer filed Sept. 25, 1978, by the assignee, *Flinn & Dreffein Engineering Company.*

Hereby enters this disclaimer to claims 1, 6, 7 and 8 of said patent.

4,006,860.—*Gail Cornelius,* Portland, and *Lloyd C. Olson,* Beaverton, Oreg. METHOD AND APPARATUS FOR TRANSPORTING AN IRRIGATION LINE. Patent dated Feb. 8, 1977. Disclaimer filed Dec. 26, 1978, by the assignee, *R. M. Wade & Company.*

Hereby enters this disclaimer to claim 26 of said patent.

4,018,913.—*Shosuke Okamoto,* Kobe, *Ryoji Kikumoto* and *Kazuo Ohkubo,* Tokyo, *Tohru Tezuka,* Yokohama, *Shinji Tonomura,* Tokyo, *Yoshikuni Tamao,* Yokohama, and *Akiko Hijikata,* Kobe, Japan. N^2-ALKOXYNAPHTHALENE-SULFONYL-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF. Patent dated April 19, 1977. Disclaimer filed Oct. 24, 1978, by the assignee, *Mitsubishi Chemical Industries, Limited.*

Hereby enters this disclaimer to claim 5 of said patent.

4,050,760.—*Lawrence S. Cohen,* Chicago, Ill. SOLDERLESS ELECTRICAL CONTACT. Patent dated Sept. 27, 1977. Disclaimer filed Dec. 26, 1978, by the inventor.

Hereby enters this disclaimer to claims 1–9 of said patent.

4,076,121.—*William J. Clayton,* Fairport, *Robert H. Olson,* Pittsford, and *Donald F. Kutniewski,* Macedon, N.Y. REINFORCED THIN WALL PLASTIC BAG, AND METHOD AND APPARATUS TO MAKE MATERIAL FOR SUCH BAGS. Patent dated Feb. 28, 1978. Disclaimer filed Dec. 20, 1978, by the assignee, *Mobil Oil Corporation.*

Hereby enters this disclaimer to claims 1–3 of said patent.

4,099,910.—*John E. Herweh,* Lancaster, Pa. SURFACE MODIFICATION OF POLYMERIC SUBSTRATES VIA INTERACTION WITH AZIDO FORMYL OR AZIDO SULFONYL COMPOUNDS. Patent dated July 11, 1978. Disclaimer filed Nov. 15, 1978, by the assignee, *Armstrong Cork Company.*

Hereby enters this disclaimer to claims 1 to 11 of said patents.

Dedication

3,407,189.—*Ernest Merian,* Bottmingen Baselland, Switzerland. WATER-INSOLUBLE MONOAZO DYESTUFFS. Patent dated Oct. 22, 1968. Dedication filed Jan. 2, 1979, by the assignee, *Fidelity Union Trust Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

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The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP 1900 Half St. SW., Washington, D.C. 20324

Patent application 922,601. Analog Tuning Voltage Circuit With Analog Signal Multiplexing. Filed July 7, 1978.

Patent application 926,471. Baffle/Nozzle Array for Cylindrical Lasers. Filed July 20, 1978.

Patent application 927,434. Circular Connector. Filed July 24, 1978.

Patent application 936,159. An Intrusion Detection System. Filed Aug. 23, 1978.

Patent application 936,160. RF Area Intruder Detection and Tracking System. Filed Aug. 23, 1978.

Patent application 937,016. An Autopointing Laser System. Filed Aug. 25, 1978.

Patent application 937,017. Signal Processing Module. Filed Aug. 25, 1978.

Patent application 937,018. Elliptic Cylindrical Baffle Assembly. Filed Aug. 25, 1978.

Patent application 938,128. Means for Improving the Collector Efficiency of an Emitting Sole Crossed Field Amplifier. Filed Aug. 30, 1978.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 934,290. High-Performance, Lightweight Structural Particleboard. Filed Aug. 17, 1978.

U.S. DEPARTMENT OF TRANSPORATION

Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 946,127. Tire Bead Inspection. Filed Sept. 27, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20460

Patent application 926,035. Use of 4-Carboxy-Phthalato-(1,2-Diaminocyclohexane)-Platinum (II) and Alkali Metal Salts Thereof in Alleviating L1210 Murine Leukemia. Filed July 19, 1978.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. SW., Washington, D.C. 20240

Patent application 936,465. Recovery of Organic and Aqueous Phases From Solvent Extraction Emulsions. Filed Aug. 24, 1978.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 888,083. Mosquito Larvae Control Using a Bacterial Larvicide. Filed Mar. 20, 1978.

Patent application 924,101. Reverse Velocity Rotor System for Rotorcraft. Filed July 12, 1978.

Patent application 926,364. Process for Preparing Isolated Junctions in Thin-Film Semiconductors. Filed July 20, 1978.

Patent application 926,781. Ring-Loaded Flexural Disc Spring. Filed July 21, 1978.

Patent application 933,366. Bis-(3,3-Dinitrobutyl)-Polysiloxane. Filed Aug. 14, 1978.

Patent application 936,158. Ion-Beam-Excited Gas Laser. Filed Aug. 23, 1978.

Patent application 939,012. A Towable Pod Assembly for Protectively Disabling Incoming Torpedoes. Filed Sept. 1, 1978.

Patent application 939,163. Optimum Diversity Combining Circuit for a Plurality of Channels. Filed Sept. 1, 1978.

Patent application 940,550. Fiber Optic Hydrophone for Use as an Underwater Electroacoustic Standard. Filed Sept. 7, 1978.

Patent application 943,406. Terrain Contour Tracking System. Filed Sept. 18, 1978.

Patent application 943,600. Remote Position Plotter. Filed Sept. 18, 1978.

Patent application 943,601. Marksmanship Training System. Filed Sept. 18, 1978.

Patent application 947,280. Improved Integrated Circuit. Temperature Gradient and Moisture Regulator. Filed Sept. 29, 1978.

Patent 4,074,567. Low Interaction Wind Tunnel Balance. Filed May 6, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,086,608. Light Emitting Diode. Filed Nov. 28, 1975. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,090,169. Method and Apparatus for Determining Relative Phase and Sensitivity of Elements in an Acoustic Array. Filed Mar. 25, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,090,793. Photometric Method and Apparatus for Measuring Packing Fraction of Terminated Fiber Optic Cables. Filed Oct. 29, 1976. Patented May 23, 1978. Not available NTIS.

Patent 4,091,040. Procedure for Making Trimethylolmethane. Filed July 21, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,091,280. Fiber Optic Position Sensing and Indicating Apparatus for Electrical Interference Sensitive Environments. Filed Sept. 13, 1976. Patented May 23, 1978. Not available NTIS.

Patent 4,092,532. Binary Apparatus for Motion Control. Filed Nov. 10, 1976. Patented May 30, 1978. Not available NTIS.

Patent 4,093,918. Means for Determining the Refractive Index Profile of the Atmosphere. Filed Aug. 16, 1976. Patented June 6, 1978. Not available NTIS.

Patent 4,093,928. Microstrip Hybrid Ring Coupler. Filed Dec. 20, 1976. Patented June 6, 1978. Not available NTIS.

Patent 4,093,950. Motion-Compensation Arrangements for MTI Radars. Filed May 16, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,093,951. Compensation for Simultaneous Platform Motion and Antenna Scanning in MTI Radars. Filed May 16, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,094,713. Sensitizing Liquid Explosives With High Gamma Gas. Filed Jan. 21, 1977. Patented June 13, 1978. Not available NTIS.

Patent 4,095,227. Asymmetrically Fed Magnetic Microstrip Dipole Antenna. Filed Nov. 10, 1976. Patented June 13, 1978. Not available NTIS.

Patent 4,097,680. Spinning Disk Electrical Isolator for a Flowing Seawater Stream. Filed Mar. 10, 1977. Patented June 27, 1978. Not available NTIS.

Patent 4,099,249. Doppler Processing Method and Apparatus. Filed Feb. 22, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,099,375. Exhaust Plume Reduction and Cooling System. Filed Feb. 3, 1977. Patented July 11, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 932,108. Tow Bar for Aircraft. Filed Aug. 9, 1978.

Patent application 938,293. Support Assembly for Cryogenically Coolable Low-Noise Choked Waveguide. Filed Aug. 31, 1978.

Patent application 938,297. Stark Cell Optoacoustic Detection of Constituent Gases in Sample. Filed Aug. 31, 1978.

Patent application 938,300. A Quartz Ball Value. Filed Aug. 31, 1978.

Patent application 938,579. A Method and Means for Growing Ribbon Crystals Without Subjecting the Crystals to Thermal Shock-Induced Strains. Filed Aug. 31, 1978.

Patent application 938,580. A Process for Converting Amorphous to Crystalline Silicon With Attendant Purification. Filed Aug. 31, 1978.

Patent application 946,990. Process for the Leaching of AP From Propellant. Filed Sept. 29, 1978.

Patent application 946,992. Ozonation of Cooling Tower Waters. Filed Sept. 29, 1978.

Patent application 946,994. An Improved Solar Cell Module. Filed Sept. 29, 1978.

Patent application 947,000. Recovery of Aluminum and Binder From Composite Propellants. Filed Sept. 29, 1978.

Patent application 950,876. Free-Piston Regenerative Hot Gas Hydraulic Engine. Filed Oct. 12, 1978.

Patent application 951,423. Oceanic Wave Measurement System. Filed Oct. 16, 1978.

Patent application 951,828. An Improved System for Slicing Silicon Wafers. Filed Oct. 16, 1978.

Patent application 951,830. Silicone Containing Solid Propellant. Filed Oct. 16, 1978.

Patent 3,932,262. Portable Electrophoresis Apparatus Using Minimum Electrolyte. Filed Oct. 15, 1973. Patented Jan. 13, 1976. Not available NTIS.

Patent 4,098,142. Rotatable Mass for a Flywheel. Filed Nov. 14, 1975. Patented July 4, 1978. Not available NTIS.

Patent 4,099,799. Cantilever Mounted Resilient Pad Gas Bearing. Filed Apr. 28, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,100,531. Bit Error Rate Measurement Above and Below Bit Rate Tracking Threshold. Filed Feb. 3, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,101,644. Process for the Preparation of Calcium Superoxide. Filed July 11, 1977. Patented July 18, 1978. Not available NTIS.

Patent 4,101,961. Contour Detector and Data Acquisition System for the Left Ventricular Outline. Filed Feb. 16, 1977. Patented July 18, 1978. Not available NTIS.

Patent 4,117,669. Apparatus and Method for Reducing Thermal Stress in a Turbine Rotor. Filed Mar. 4, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,117,749. Wire Stripper. Filed Aug. 9, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,117,881. System for and Method of Freezing Biological Tissue. Filed June 14, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,014. Vehicular Impact Absorption System. Filed Aug. 19, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,315. Water System Virus Detection. Filed Apr. 28, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,620. Computerized System for Translating a Torch Head. Filed May 20, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,665. Time Domain Phase Measuring Apparatus. Filed Dec. 8, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,666. Automatic Communication Signal Monitoring System. Filed Mar. 4, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,671. Traveling Wave Tube Circuit. Filed Feb. 15, 1977. Patented Oct. 3, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 27, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-2-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry: Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-4-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-4-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-22-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-21-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-12-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-11-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,015,103 to 3,019,439, inclusive
Plant Patents..... Numbers 2,117 to 2,129, inclusive

REISSUES

FEBRUARY 27, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

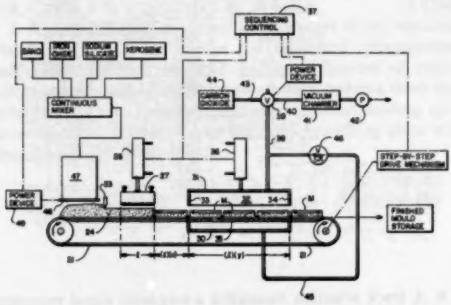
Re. 29,919
APPARATUS FOR MAKING FOUNDRY MOULDS

Kent Woonton, Kitchner, Canada; Jeffrey R. Short, III, Lincolnshire, Ill., and Kenneth N. Roach, Willowdale, Canada, assignors to J. R. Short Milling Company, Chicago, Ill.

Original No. 3,796,250, dated Mar. 12, 1974, Ser. No. 371,532, Jun. 19, 1973. Continuation-in-part of Ser. No. 154,763, Jun. 21, 1971, Pat. No. 3,739,834. Application for reissue Feb. 22, 1977, Ser. No. 771,007

Int. Cl.[2] B22C *15/02*

U.S. Cl. 164—161 **7 Claims**



1. In an apparatus for high speed production of foundry mould parts from a curable sand mix having adequate plastic flowability for pressure moulding, the combination of

an endless horizontal conveyor extending from a mix depositing station to a forming station;

means at the mix despositing station for depositing the sand mix on the conveyor and forming the deposited mix into a bed of predetermined depth;

drive means connected to said conveyor to drive the same stepwise to advance the bed of sand mix from the depositing station to the forming station in steps of equal length;

a press unit located at the forming station and comprising

a flat support operatively arranged with respect to said conveyor to rigidly support against downward movement the portion of the bed of sand mix presented at the forming station by stepwise advance of the conveyor,

a pattern carrier,

[a bed severing device, and]

a combination shroud and bed severing device, and

vertically acting power means connected to said pattern carrier and said *combination shroud and* bed severing device to drive the same downwardly toward said flat support and to return the same upwardly to positions adequately spaced above said conveyor to allow unimpeded movement of said bed of sand mix at the forming station,

said [bed severing device inclusing a portion which extends transversely of the conveyor in a position to sever from the trailing portion of the bed a portion of the bed adequate for the mould part to be formed.] *combination shroud and bed severing device comprising two flat mutually parallel wall members extending transversely of said conveyor and spaced apart by a distance such that the edges of said wall members which are directed toward the conveyor are separated by a distance substantially equal to the length of said equal steps through which the conveyor is driven, the one of said two wall members which is nearer the mix depositing station being operative as a severing device to sever from the trailing portion of the bed a portion of the bed adequate for the mould part to be formed,*

said power means being capable of operation, in response to completion of a step of movement of the bed by said conveyor, to drive said *combination shroud and bed* severing device downwardly into engagement with the conveyor, *whereupon the severed portion of the bed is laterally confined by said combination shroud and bed severing device,* and to drive said pattern carrier downwardly to press the severed portion of the sand mix into the shape determined by a pattern carried by said pattern carrier.

Re. 29,920
HIGH TEMPERATURE ALLOYS

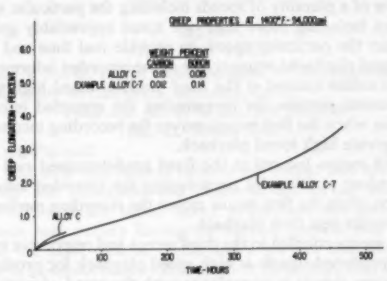
James F. Baldwin, 220 MacFarlane Dr., Delray Beach, Fla. 33444

Reissued No. Re. 28,681, dated Jan. 13, 1976, Ser. No. 598,111, Jul. 29, 1975.

Original No. 3,869,284, dated Mar. 4, 1975, Ser. No. 346,815, Apr. 2, 1973. Application for reissue Feb. 11, 1977, Ser. No. 767,956

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—134 F **46 Claims**



69. A nickel base alloy for use at relatively high temperatures consisting essentially of the following elements in the weight percent ranges set forth:

ELEMENTS	PERCENT
Chromium	5 – 22
Aluminum	0.2 – 8
Titanium	0.5 – 7
Boron	0.0 – 0.25
Carbon	less than 0.05
Cobalt	2 – 17
Columbium	0.00 – 3
Molybdenum	0.00 – 8
Tantalum	0.00 – 10
Vanadium	0.00 – 2
Tungsten	0.00 – 20
Rhenium	0.00 – 2
Zirconium	0.00 – 1.00

the balance of the alloy being essentially nickel and minor amounts of impurities and incidental elements which do not detrimentally affect the basic characteristics of the alloy, said nickel being present in an amount of from about 35% to 85% by weight.

Re. 29,921

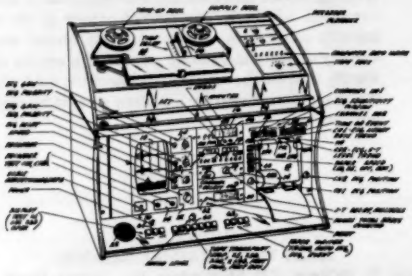
ELECTROCARDIOGRAPHIC COMPUTER

Isaac R. Cherry, Mission Viejo, and Donald L. Anderson, San Juan Capistrano, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Original No. 4,073,011, dated Feb. 7, 1978, Ser. No. 717,651, Aug. 25, 1976. Application for reissue Apr. 24, 1978, Ser. No. 899,241

Int. Cl.[2] A61B 5/04; G06F 15/42

U.S. Cl. 364—900 54 Claims



1. A dynamic multispeed ECG computer for reproducing ECG information contained on a recording medium recorded at a particular speed, including:

first means for moving the recording medium past at least one fixed predetermined real time readout position and at least one fixed predetermined high speed readout position,

second means coupled to the first means for controlling the first means to move the recording medium at a selected one of a plurality of speeds including the particular speed and including more than one speed appreciably greater than the particular speed, to provide real time and high speed playbacks respectively of the recorded information,

third means located at the fixed predetermined high speed readout position for reproducing the recorded information when the first means moves the recording medium to provide high speed playback,

fourth means located at the fixed predetermined real time readout position for reproducing the recorded information when the first means moves the recording medium to provide real time playback,

fifth means coupled to the third means and responsive to the reproduced signals at high speed playback for producing output signals in accordance with the trend of particular characteristics of the ECG complexes at high speed playback,

sixth means coupled to the third means and responsive to the reproduced signals for producing control signals indicative of the occurrence of the predetermined events within the characteristics of the ECG complexes, and

seventh means coupled to the sixth means and the second means and responsive to the control signals provided by the sixth means for controlling the second means to move the recording medium at the real time playback speed upon the occurrence of the predetermined events within the characteristics of the ECG complexes.

Re. 29,922*

TRACK SELECTION CONTROL MEANS FOR MAGNETIC SIGNAL RECORDING AND REPRODUCING SYSTEMS

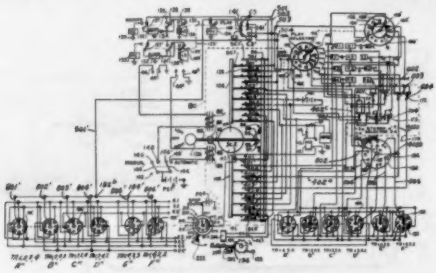
Sidney O. Sampson, P.O. Box 3261 Grand Central Station, New York, N.Y. 10017

Original No. 3,315,041, dated Apr. 18, 1967, Ser. No. 432,049, Jan. 22, 1965. Application for reissue Jan. 25, 1972, Ser. No. 220,719

Formerly scheduled for issue and publication on Jul. 12, 1977.

Int. Cl.[2] G11B 15/12

U.S. Cl. 360—63 2 Claims



9. A track selection means for a magnetic signal recording system, comprising a head assembly including multiple recording heads and multiple associated erase heads disposed on the tracks of a multiple track tape for recording and erasing signals, a play selector control, said recording heads and said erase heads being connected to said play selector control, said play selector control having multiple track selection positions and having a stereo tracks position, said stereo tracks position being disabled when any track selection position is selected, said play selector control including selective switch means arranged for selectively activating and deactivating the heads, and means connecting respective recording means, and respective erasing means to the respective operating selective switch means of said play selector control for energizing same thereby applying track selection means for selectively activating and deactivating respective operating heads disposed on the tracks of the multiple track tape for selected positions of the control; whereby said play selector control selectively activates one recording head and one respectively associated erase head simultaneously on one track at the selected position of said multiple track selection positions thereby disabling said stereo tracks position, and activates another recording head and another respectively associated erase head simultaneously on another track at another selected position while simultaneously deactivating said one recording head and said one respectively associated erase head.

* Issued Feb. 23, 1979.

PLANT PATENTS

GRANTED FEBRUARY 27, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,385

ROSE PLANT

Samuel D. McGredy, P.O. Box 14-100, Auckland, New Zealand

Filed Feb. 3, 1978, Ser. No. 874,824
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, recurrent flowers of yellow coloring borne singly and in small clusters, opening from long pointed buds with long sepals displaying cerise shading upon showing color, produced on a vigorous, branching plant with abundant, shiny, waxy foliage.

4,386

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Mar. 15, 1978, Ser. No. 886,697
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,387

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Mar. 15, 1978, Ser. No. 886,703
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,388

WALNUT TREE

Harold I. Forde, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 21, 1978, Ser. No. 898,597
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—32 **1 Claim**

1. The new and distinct cultivar of walnut tree herein described and illustrated and characterized by its semi-upright growth, moderate vigor, heavy production and mid-season harvest; said variety having its start of growth and its harvest about the same time as Hartley; said variety being further characterized by its production of pistillate flowers on nearly all shoots from terminal buds and on about 80 percent of shoots from axillary buds; said percent being substantially higher than other varieties currently in use and which have the same time of starting growth and nut maturity; said variety being primarily characterized by its nut, a majority of the kernels of which are light colored and glossy; said nut being nearly elliptical in longitudinal section with a small point at the apex and having a nut shell of medium light color, nearly smooth and well filled and sealed.

4,389

WALNUT TREE

Harold I. Forde, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 21, 1978, Ser. No. 898,598
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—32 **1 Claim**

1. The new and distinct cultivar of walnut tree herein described and illustrated and characterized by its spreading growth, moderate vigor, heavy production and mid-season harvest; said variety having its start of growth and leafing about the same time as Payne and a harvest time about the same as Lompoc, namely about two or three days after Hartley and 16 days after Payne; said variety being further characterized by the production of pistillate flowers on nearly all shoots from terminal buds and on about 80 percent of shoots from axillary buds; said variety being primarily characterized by its nut the kernel of which is light in color with some light amber and amber; said nut being elliptical in longitudinal section, round in cross section and having a nut apex which terminates in a small beak-shaped point; said variety also being characterized by its nut shell, which is thin, light colored, smooth and well filled and sealed.

PATENTS

GRANTED FEB. 27, 1979

ERRATA

For CLASS	See PATENT NO.
015–236 R	4,141,111
015–256.51	4,141,112
029–450	4,141,221
033–293	4,141,310
181–118	4,141,431
237–002 B	4,141,490
277–080	4,141,547
250–436	4,141,686
422–216	4,141,690
521–129	4,141,862
528–093	4,141,885
528–273	4,141,886
546–045	4,141,897
546–121	4,141,898
546–118	4,141,899
568–636	4,141,921
568–864	4,141,930
428–165	4,142,007
244–026	4,142,046
365–178	4,142,111
310–360	4,142,124
355–014	4,142,165

PATENTS

GRANTED ON TUESDAY

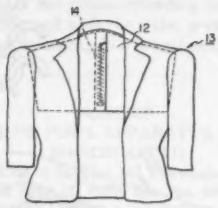
ENDED

PATENTS

GRANTED FEBRUARY 27, 1979

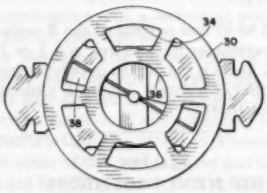
GENERAL AND MECHANICAL

4,141,082
WASH-AND-WEAR COAT
Itta Nakazawa; Isamu Kada, both of Otsu, and Yoshiaki Fukutomi, Kyoto, all of Japan, assignors to Toray Textiles Inc., Tokyo, Japan
Filed Oct. 28, 1977, Ser. No. 846,343
Claims priority, application Japan, Oct. 29, 1976, 51-129418; Jan. 19, 1977, 52-4221
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—93 **3 Claims**



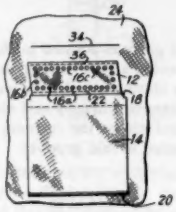
1. A wash-and-wear coat comprised of outer cloths, lining cloths and interlining cloths, all consisting essentially of synthetic fibers and having a shrinkage of 1.0% or less, determined in accordance with the method of JIS L 1042, and sewing threads consisting essentially of synthetic fibers and having a shrinkage of 1.0% or less, determined in accordance with the A method of JIS L 1008, said interlining cloths being bonded to said outer cloths at a peeling strength of at least 400 g/2.54 cm, determined in accordance with the B method of JIS L 1018, after the first time of laundering in accordance with the H method of JIS L 1018, and said lining cloths having an air permeability of from 100 to 300 ml/cm^2/second, determined in accordance with the method of JIS L 1079.

4,141,083
PERSONAL AIR CONDITIONING UNIT
William A. Waters, 3648 E. 49th St., Tulsa, Okla. 74135
Continuation-in-part of Ser. No. 387,956, Aug. 13, 1974, Pat. No. 3,881,198. This application Mar. 28, 1975, Ser. No. 563,066
Int. Cl.[2] A42C *5/04*
U.S. Cl. 2—171.3 **3 Claims**



1. A self-contained detachable air conditioning unit for headwear and comprising housing means having grid element means provided therein permitting air flow therethrough, power means carried by said grid element means and extending into the interior of the housing means, impeller means carried by the power means and encased within the housing means and being rotatable by the power means for pulling air into the housing through said grid element means and discharging air from the housing, power supply means operably connected with the power means for selective activation thereof, and securing means provided on the housing means and cooperating between the housing means and headwear for removably securing the self-contained air conditioning unit to the headwear whereby said self-contained detachable air conditioning unit may be removed from the headwear for permitting conventional use of the headwear, and wherein the securing means comprises a pair of outwardly extending flap members provided on the housing means for removable engagement with the headwear.

4,141,084
WELT FOR CLOTH ARTICLES
Charles Krieger, 60 E. End Ave., New York, N.Y. 10022
Filed Nov. 23, 1977, Ser. No. 854,425
Int. Cl.[2] A41D *27/20*
U.S. Cl. 2—247 **14 Claims**

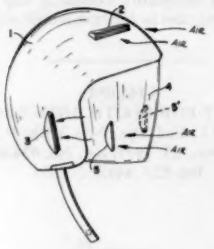


1. A method of making a welt for clothing or the like which comprises providing a first substantially oblong welt panel, providing a second thin substantially oblong guide panel, said first and second panels being of substantially equal sizes, providing a linear deformation in said guide panel near and substantially parallel to each edge thereof, coextensively placing one of said panels on the other, adhering the facing surfaces of said panels to one another in registered alignment, so that a combined panel having a thickness of both said welt and said guide panels conjoined and a generally rectangular configuration equal to that of said panels is formed, providing a third pocket panel having a linear tab along an edge, placing said combined panel on said third panel with a long edge of said combined panel in substantial registration with an end edge of said third panel and with said welt panel against said pocket panel, sewing said linear tab to said combined panel along a first line between said registered edges and a nearby first linear deformation while using said linear deformation as a guide, forming a linear slit in a cloth article, so placing said combined panel with said cloth article that a second linear deformation parallel to said first linear deformation in said guide panel is substantially parallel to and spaced below said slit, with said welt panel facing said cloth article, attaching said combined panel to said cloth article by a second line of sewing parallel with said second linear deformation, folding said combined panel about said second line of sewing and above said slit, folding the free end of said combined panel about the edge of said slit, sewing the free end of said pocket panel to said cloth article adjacent to the opposite side of said slit, and inserting the pocket in the slit.

4,141,085
VENTED HELMET AND FACE SHIELD
John Adams, Sr., 2778 N. 19th St., Milwaukee, Wis. 53206
Filed Sep. 22, 1977, Ser. No. 835,715
Int. Cl.[2] A42B *3/00;* A12C *5/04;* A61F *9/06*
U.S. Cl. 2—410 **1 Claim**

1. A vented helmet and face shield, comprising
a safety helmet having a plurality of air vents formed therein in mutually spaced relation; and
a face shield affixed to the helmet and having a plurality of

air vents formed therein in mutually spaced relation, each of the air vents having a movable closing member and being selectively openable and closable via the closing member, each of said air vents comprising a slot, a raised cover over the slot spaced from the corresponding one of the helmet and face plate to form an opening, a pair of



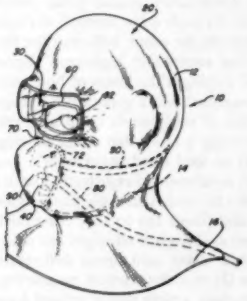
spaced parallel grooves formed in the cover on opposite sides of the opening and extending along the length of the opening and a closing member movably mounted in the grooves in a manner whereby said closing member selectively opens and closes the opening to a desired extent when it is inserted in said grooves.

4,141,086

FOG FREE SKI MASK

Allen F. Jackson, P.O. Box 1271, Breckenridge, Colo. 80424

Filed Mar. 17, 1977, Ser. No. 778,600
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—436 **7 Claims**



1. A fog-free ski mask for covering the head of a skier, said apparatus comprising:

form fitting flexible material encircling and covering the head, neck and partial shoulder area of said person, the material around said neck area being capable of stretching over said head and snugly constricting around said neck, said material having a formed slot located at the eyes of said person,

goggles attached to said material around the periphery of said slot,

means covering the nose and mouth of said person and attached to the inside surface of said material for delivering and removing air from said nose and mouth from and to a region below the neck area, said delivering means being capable in conjunction with the body heat of said skier of pre-warming said delivered air, and

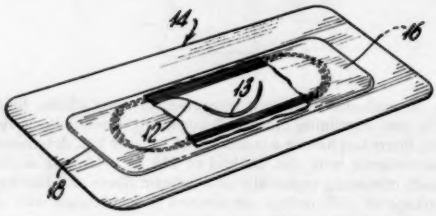
means connected to said delivering and removing means for firmly holding said delivering and removing means to a region of said face around said nose and mouth, said holding means being disposed between the inside surface of said material and the outer surface of said head.

4,141,087

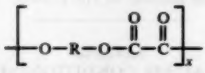
ISOMORPHIC COPOLYOXALATES AND SUTURES THEREOF

Shalaby W. Shalaby, Long Valley, and Dennis D. Jamiolkowski, Paterson, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 19, 1977, Ser. No. 752,374
Int. Cl.[2] A61F *1/24;* A61L *17/00;* C08G *63/18;* A61F *1/00*
U.S. Cl. 3—1 **21 Claims**



1. A synthetic absorbable suture of oriented fiber comprising an isomorphic polyoxalate polymer consisting essentially of units of cyclic and linear oxalates and having the general formula



wherein each R is

$$-(CH_2)_n - A - (CH_2)_n- \qquad \text{I}$$

or

$$-(CH_2)_{4+2n}- \qquad \text{II}$$

and from about 5 to 95 mol percent of the R units are I; A is trans 1,4-cyclohexylene or p-phenylene, n is 1 or 2 and is the same for I and II, and x is the degree of polymerization resulting in a fiber forming polymer having a molecular weight greater than about 10,000.

4,141,088

HIP JOINT PROSTHESIS

James T. Treace, Malibu, Calif., and Dan H. Treace, Louisville, Ky., assignors to Richards Manufacturing Company, Inc., Memphis, Tenn.

Continuation of Ser. No. 768,604, Feb. 14, 1977, abandoned.
This application Jul. 5, 1977, Ser. No. 812,614
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.912 **14 Claims**

8. A prosthetic hip joint femoral component comprising:

a. a head for movable reception in a socket,

b. a stem for implanting in the femoral canal, said stem having proximal and distal ends, said stem having an uninterrupted outer surface and being continuously tapered from said proximal end to said distal end, and

c. a neck portion being rigidly joined at one end thereof to said stem at said proximal end of said stem to provide a

shoulder at the juncture of said stem and rigidly joined at the other end thereof to said head, said neck portion being elliptical in cross-section with the narrower portion or

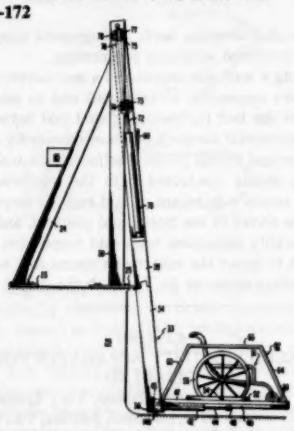
shorter axis of the ellipse extending in an anterior-posterior direction and with the wider portion or longer axis of the ellipse extending in a lateral-medial direction.

4,141,089

SWIMMING POOL APPARATUS FOR THE HANDICAPPED

Keith Krumbeck, 4475 N. 73rd St., Milwaukee, Wis. 53218

Filed May 31, 1977, Ser. No. 801,466
Int. Cl.[2] E04H *3/16*; B66B *9/00*
U.S. Cl. 4—172 **14 Claims**



1. Swimming pool apparatus for handicapped persons comprising: in combination with a swimming pool;

a wheelchair lift platform; and

means for mounting said lift platform at the edge of the swimming pool so that a wheelchair can be readily wheeled onto and off of said platform respectively from and back to the deck of said swimming pool;

said lift platform including means for lowering said platform into the water of said pool with the seat of the wheelchair submerged and for elevating said platform out therefrom, wherein said platform includes a fixed stop for the wheels of said wheelchair, said wheel stop being positioned adjacent the outer end of said platform and transversely to the direction of wheeling onto said platform to prevent wheeling off said outer end;

and means for releasably securing a wheelchair to said platform to retain the wheelchair thereon against buoyancy effects when lowering said wheelchair into said pool and raising said wheelchair therefrom,

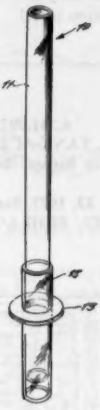
whereby a handicapped person can sit on a wheelchair secured to said platform while being submerged, can swim away from a submerged wheelchair, and can swim back to the submerged wheelchair to be elevated out of said swimming pool.

4,141,090

TRAP AND DRAIN FLUSH OUT KIT

Thomas Rowan, 39 Benson St., Bloomfield, N.J. 07003

Filed Feb. 7, 1977, Ser. No. 766,227
Int. Cl.[2] E03C *1/306*
U.S. Cl. 4—256 **2 Claims**



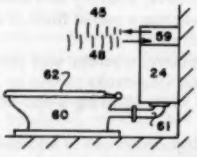
1. A trap and drain flush out kit, comprising in combination, a flexible plastic tube, a flexible plastic sleeve and a flexible rubber grommet, said flexible plastic tube snug-fitted but slidable in said flexible plastic sleeve and capable of extending completely therethrough, said flexible plastic sleeve being snug-fitted but slidable in said flexible rubber grommet and extending completely through the grommet, said tube being of sufficient length so as to reach between a fresh water faucet and extend into a drain of a basin, tub, or the like, said flexible plastic sleeve having a diameter to snugly fit into a drain of a conventional size and said flexible rubber grommet being of a diameter to snugly fit into a drain of a different size such as the type accepting a basket strainer, the length of the flexible plastic sleeve being substantially less than said flexible plastic tube and the length of said flexible rubber grommet being less than said flexible plastic sleeve.

4,141,091

AUTOMATED FLUSH SYSTEM

Charles F. Pulvari, 2014 Taylor St., NE., Washington, D.C. 20018

Filed Dec. 10, 1976, Ser. No. 749,426
Int. Cl.[2] E03D *1/00*, *5/10*; G01S *9/66*
U.S. Cl. 4—313 **1 Claim**



1. In an automated flush system having an electrically controllable flush valve in the flush system and control means for controlling said flush valve, the improvement comprising:

sensing means including transmitting means for establishing a sensing field, for sensing the approach and departure motion of a user with respect said sensing means, receiving means for receiving reflected frequency shifted signals of said approaching and departing user, and signal processing means producing electrical control signals indica-

tive of the approach and departure motion, respectively, of said user with respect to said sensing means, and a

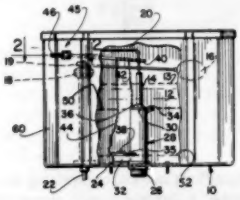
discrimination unit for receiving and decoding said approach and departure motion caused signals to produce a flush control signal for controlling said flush valve during the departure cycle only as a result of the occurrence of said departure motion signal.

4,141,092

DUAL-FLUSH, TANK-ACTUATING DEVICE

Ian R. Jones, 30817 Via Rivera, Rancho Palos Verdes, Calif. 90274

Filed Jun. 13, 1977, Ser. No. 806,078
Int. Cl.[2] E03D *1/22, 5/02*
U.S. Cl. 4—324 **6 Claims**



1. A dual-actuating, flush device for toilets having a dual-discharge-valve mechanism, whereby a partial or a full flush is selected by the operation of said device, wherein the device comprises:

a housing arranged to be mounted to said toilet having a forward bore and rear bore disposed therein;

an annular flange member disposed between said forward and rear bores, said flange defining an aperture therein;

a slidable shaft positioned in said forward and rear bores for longitudinal movement therein;

a handle mounted to one end of said shaft;

a lever arm affixed to one end of said shaft opposite that of said handle;

limiting means arranged between said shaft and said housing for selective movement of said lever arm;

wherein said limiting means comprises:

a bayonet slot member formed in said housing; and

a pin mounted to said shaft and operably received in said bayonet slot member, to selectively control the movement of said lever arm which is operably attached to said dual-discharge valve mechanism; and

wherein said bayonet slot member includes:

a short-stroke groove, whereby movement of said handle is limited and wherein a partial flush of water is allowed to be discharged; and

a long-stroke groove, whereby said pin is arranged to be received in said long-stroke groove by longitudinal movement of said shaft, allowing a full flush of water to be discharged;

biasing means disposed in one of said bores and arranged to engage said shaft;

wherein said biasing means comprises:

a spring member;

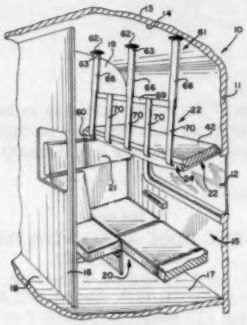
an annular lip member disposed on said shaft wherein said spring member is positioned between said annular lip member and said annular flange members, whereby said pin mounted to said shaft is biased in engagement with said short-stroke groove; and wherein said shaft must be moved longitudinally against the force of said spring member, to allow said pin to be received in said long-stroke groove.

4,141,093

SLEEPING BERTH FOR PASSENGER CAR COMPARTMENT

Dennis B. Marsden, Griffith, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,506
Int. Cl.[2] B62D *33/06;* **A47C** *17/40*
U.S. Cl. 5—9 R **22 Claims**



3. A suspended sleeping berth arrangement supported on a wall and an overhead structure comprising;

a bed having a wall side means and a user access side means,

hinge means connected to said wall and to said wall side means of the bed for swinging said bed between a relatively horizontal sleeping position outwardly of the wall and a vertical stored position adjacent the wall,

suspension means connected with the overhead structure and the access side means of said bed for suspending said bed from above in the horizontal position, and

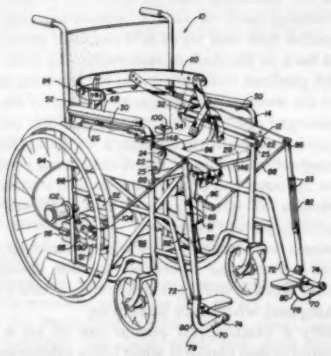
means operably associated with said suspension means and operable to move the suspension means in a stowed position assisting to move the bed into the stored position.

4,141,094

INCREASED MOBILITY APPARATUS FOR THE DISABLED

Andrew M. Ferguson, Merritt Island, Fla.; Ernest V. Keith, Dover, Del., and David C. Hatchell, Fairfax, Va., assignors to Reme Enterprises, Inc., Dover, Del. and National Patent Search Associates, Inc., Arlington, Va.

Filed Oct. 27, 1976, Ser. No. 735,963
Int. Cl.[2] A47A *1/02;* **A61G** *7/06, 15/00*
U.S. Cl. 5—81 R **25 Claims**



1. In a wheelchair or the like having a frame and a seat portion connected to said frame, the improvement comprising:

harness means adapted to support an occupant of the wheelchair, and

means operatively connected to said frame and to said harness means for moving said harness means between a lower position adjacent said seat portion and an upper position spaced from said seat portion, said moving means comprising a linkage pivotally connected to said frame and power means mounted on said frame and connected to said linkage for moving it relative to said frame, said linkage being provided with a lifting member having a lifting bracket at the free end of said linkage that is engagable with said harness means for moving same,

whereby an occupant of the wheelchair may be lifted upwardly to a position spaced above said seat portion by said harness means and said moving means.

4,141,095

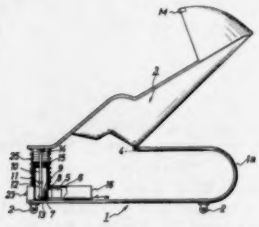
ELECTRONIC CRADLE

Kouji Adachi, 1048, Fuchinobe, Sagamihara-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 694,195, Jun. 9, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,768

Int. Cl.[2] A47D *9/04*

U.S. Cl. 5—108 **13 Claims**



1. A rocking cradle comprising in combination: a support having a limitedly elastically vertically displaceable pivot; a cradle body shaped to hold a baby having a center of gravity in a predetermined position with said center of gravity above said pivot; and rocking means remote from said pivot and connected between said cradle body and said support for oscillating said cradle body on said pivot, said rocking means comprising a vertically oscillating rod lying on an upright axis and having a top and a bottom end, a motor having a rotatable drive shaft, and means connecting said motor and the bottom end of said rod for converting rotary motion of a drive shaft into longitudinal motion for vertically oscillating said rod, said cradle body having a top head portion, an intermediate seat portion and a bottom foot portion, said foot portion being fixed to the top end of said rod, said foot portion oscillating about a location which is located in a common approximately horizontal plane perpendicular to said rod, whereby said cradle body is tilted about said pivot.

4,141,096

METHOD AND MEANS FOR PRODUCING MOTION IN WATER BEDS

Harry O. Hale, and Joyce A. Taylor, both of 11411 Jola Ave., Garden Grove, Calif. 92643

Filed Sep. 26, 1977, Ser. No. 836,296

Int. Cl.[2] A61H *1/00*

U.S. Cl. 5—108 **6 Claims**

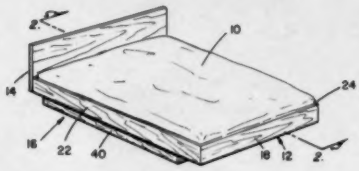
1. For a water bed, a support comprising in combination:

a platform of size to accommodate the lower wall of a water bed arranged for generally horizontal disposition;

a region of said platform being mounted for movement in a direction to tilt a portion of the lower wall of a water bed when disposed on said platform; and

means for lifting and lowering said region of the platform by tilting it periodically;

said platform comprising a flat structure formed with an opening within its margins and said region of said platform comprising a member disposed over said opening and



movable in a vertical direction relative to said flat structure;

said region of said platform having at least one edge wall lying in a plane which is not parallel to the plane of any edge wall of said flat structure.

4,141,097

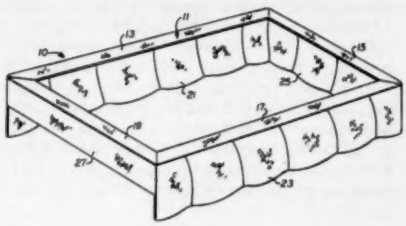
DUST RUFFLE

Ronald Levinsohn, and Martin Baron, both of 320 Fifth Ave., New York, N.Y. 10001

Filed Nov. 17, 1977, Ser. No. 852,544

Int. Cl.[2] A47C *21/00*

U.S. Cl. 5—333 **5 Claims**



1. A dust ruffle for use over a bed frame to provide a desired enclosure for the lower portion of the bed, said dust ruffle comprising:

a top portion dimensioned to overlie the top of the bed frame;

vertically extending portions extending along the sides and foot and head of the bed;

at least the vertically extending portion extending along the sides extending down to a point touching or slightly above the floor;

at least one of said vertically extending portions being dimensioned to be slightly smaller than the length of the sides and foot of the bed;

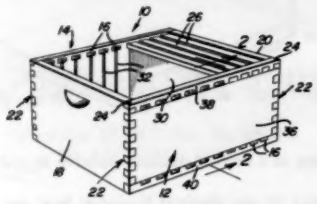
and a retaining panel along the head of the bed extending vertically from the top portion and dimensioned to be slightly shorter than the length of the head of the bed, said retaining panel and vertically extending portions being secured together along their vertical lines of juncture by elasticized means, at least along the upper portion thereof adjacent the top panel and surrounding the bed frame or box mattress in connection with which dust ruffle is to be employed, whereby there will be an elasticized interengagement between the dust ruffle and the bed frame or box mattress.

4,141,098

HONEY SUPER

Vernon C. Culhane, 2729 CR 228, and Danny F. Culhane, 300 Waters Way, CR 228, both of Durango, Colo. 81301, assignors to Vernon C. Culhane and Danny F. Culhane, both of Durango, Colo.

Filed Sep. 20, 1976, Ser. No. 724,530
Int. Cl.[2] A01K *47/02*
U.S. Cl. 6—2 R **8 Claims**



1. A honey super, comprising, in combination:

(a) a pair of opposing end walls each provided with a set of two sockets each one of a set being disposed directly opposite the corresponding socket provided in the other of the end wall;

(b) a pair of side walls connected to and extending between the end walls;

(c) a pair of bars disposed in the sockets for partially forming a comb frame disposed in the honey super; and

(d) a comb foundation attached to the bar and to the end walls of the super, the end walls partially forming the comb frame, each set of two sockets being disposed in a plane substantially parallel to the side walls; and one of the pair of bars being a top bar and the other of the bars being a bottom bar, the bars being disposed in the sockets and attached to the foundation for supporting same, there being a plurality of sets of sockets provided in each of the end walls, and a plurality of top and bottom bars and comb foundations forming a plurality of frames in conjunction with the plurality of sockets and with the end walls, each of the end wall and top and bottom bars being provided with a groove extending between the sets of sockets, the entire length of the foundation being received in the groove.

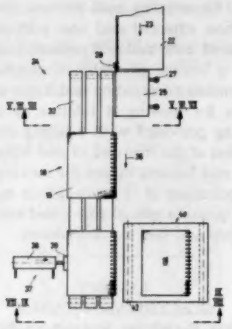
4,141,099

PADS

Guido Negro, Neuffen; Frider Mann, Nüertingen, and Hermann Buck, Hüelben, all of Fed. Rep. of Germany, assignors to Bielomatik Leuze & Company, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,208
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620688
Int. Cl.[2] B42B *5/12*; B42C *19/08*
U.S. Cl. 11—1 A **6 Claims**

1. An apparatus for binding pads, such as exercise books, calendars and the like, having a relatively stiff backing leaf, the apparatus being of the kind which inserts a comb binding through a row of holes along the spine of the pad and curves the teeth of the comb over to form a closure joint along the spine, the improvement comprising turn-over means for turning over the relatively stiff backing leaf from a position overlying the front leaf of the pad in which the pad was assembled before the insertion of the comb to a position underlying the pad with the closure joint located between the penultimate leaf of the pad and the immediately underlying backing leaf, said turn-over means comprising: a hinging mechanism for swinging over said backing leaf, said hinging mechanism being pivotable from a first position, in which the backing leaf of the pad is lowermost and the penultimate leaf is uppermost, to a second position in which the pad is turned over, so that the penultimate leaf is lowermost; and, gripping means for gripping the



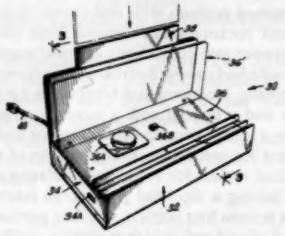
last leaf to turn the latter back when said hinging mechanism is pivoted back to said first position.

4,141,100

BINDING MACHINE AND COVER FOR USE THEREWITH

William E. Domroe, 2858 Shore Rd., Bellmore, N.Y. 11710; Thomas W. F. Lindquist, R.D. #3 - Deerfield Rd., Lake Katonah, and Robert Stern, 16 Winthrop Rd., Port Washington, both of N.Y. 11050

Filed Sep. 27, 1976, Ser. No. 726,613
Int. Cl.[2] B42C *19/00*
U.S. Cl. 11—1 AD **27 Claims**



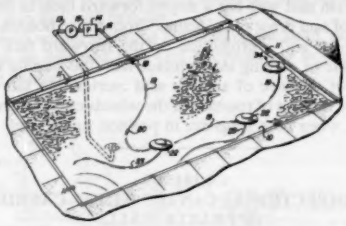
1. Apparatus for affixing a plurality of loose pages into bound form comprising binding means for receiving said pages in cooperation with a glue member thereon, a chassis having an upper carriage means movable between a loading position loosely accommodating said binding means with said pages therein and a binding position to retain said binding means with said pages therein, heating assembly means mounted on said chassis and substantially underlying said carriage means said binding position for providing heat to said binding means during a binding cycle to melt said glue member, timing means for controlling the application of heat from said heating assembly to said binding means and indicating means for signaling the conclusion of said binding cycle, wherein said heating assembly means comprises printed circuit means for providing said heat to said binding means and conductive means for conveying said heat from said printed circuit means to said binding means.

4,141,101

SELF PROPELLED DRIVEHEAD FOR AUTOMATIC SWIMMING POOL CLEANER

Michael C. Gibellina, 8350 E. Cherry Lynn, Scottsdale, Ariz. 85251

Filed Jan. 9, 1978, Ser. No. 868,139
Int. Cl.[2] E04H *3/20*; B08B *9/08*
U.S. Cl. 15—1.7 1 Claim



1. A drivehead for an automatic swimming pool cleaning system, which system includes,

at least one elongate flexible cleaning hose having an inner fixed end and an outer free end,

means for supplying water under pressure to the inner fixed end of said cleaning hose to cause said hose to randomly oscillate, thereby abrading the inner surfaces of the swimming pool to dislodge particulate material therefrom and maintain said particulate material in suspension in the pool water for removal by the pool water filtration system, and

drivehead means operatively associated with said cleaning hose to move the inner water receiving end thereof to different locations within said pool to effect random contact between said oscillating hose and substantially all of the interior surfaces of said pool,

said drivehead comprising:

(a) a horizontal platform member;

(b) a circular wheel member mounted horizontally for free rotation on said platform member, the periphery of said wheel member extending laterally beyond the periphery of said platform member;

(c) a water jet nozzle carried by said platform member, disposed to eject a stream of water therethrough, the reaction force of which urges said wheel member into rolling contact with and along the sides of said pool; and

(d) means for connecting a flexible water supply hose to said nozzle for effecting fluid communication between said nozzle and a source of water under pressure,

said water jet nozzle and said supply hose cooperating, when said drivehead encounters an obstruction, to cause said platform member to rotate within said circular wheel member, to move said drivehead around the obstruction and continue its normal movement in rolling contact with and along the sides of said pool.

4,141,102

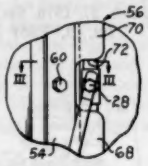
WINDSHIELD WIPER RESTRAINT DEVICE

Dean M. Lawrence, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 14, 1977, Ser. No. 851,244
Int. Cl.[2] B60S *1/04*
U.S. Cl. 15—250.16 3 Claims

1. In a windshield assembly having a frame, a windshield movably supported on the frame, a windshield wiper assembly having a wiper blade, said blade being movable across the windshield between predetermined spaced locations and to a blade storage position adjacent one of the spaced apart locations, the improvement comprising:

blade restraining means for automatically maintaining the blade at the stored position in contact with the windshield



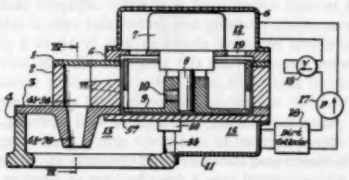
in the presence of said windshield and against movement in directions substantially normal to the windshield.

4,141,103

CLEANER USING HIGH VELOCITY AIR JETS HAVING A DOUBLE VALVE

W. Paul Crise, 4921 NE. 2nd Ave., Pompano Beach, Fla. 33064

Filed Apr. 11, 1977, Ser. No. 786,257
Int. Cl.[2] A47L *5/14*
U.S. Cl. 15—346 6 Claims



1. A cleaning tool for carpet or material, including, an elongated member connected throughout its length with a normally substantially horizontal elongated opening, adapted to engage the surface of the material being cleaned; an elongated cavity, permanently open to the opening, and ending as an outlet opening, said elongated member having a plurality of nozzle passages for discharging gas from a valve rotor cavity against the material being cleaned, positioned above where the elongated opening engages the surface of the material, and spaced longitudinally, along the length of said member, said outlet opening connected to the inlet of a gas moving means; a cylindrical valve rotor cavity, connected through inlet passages from the outlet of said gas moving means to an inlet manifold, and having a plurality of outlet passages spaced around the circumference of said rotor cavity, arranged in a plurality of rows one row above the other leading away from it, each outlet passage connecting separately to at least one of the nozzle passages for discharging jets of gas from said valve rotor cavity against the material being cleaned, said outlet passages leading from the cylindrical valve rotor cavity to the nozzle passages being so proportioned that the areas of their cross sections vary substantially in proportion to a function of their length, the areas of their cross sections increasing gradually as the passages leave the valve rotor cavity, until the areas of their cross sections reach the desired values; a rotatable valve member positioned in said valve rotor cavity wherein the improvement comprises:

a plurality of outer wall openings of said valve rotor member arranged in a plurality of rows one row above the other, positioned vertically so that said openings in the outer wall of said rotor will be on the same level as that of the outlet passages leading from the valve rotor cavity to the jet nozzle passages, said openings in the outer wall of the valve rotor being so positioned around its circumference that when rotated the jet nozzle passages will receive gas in the desired order;

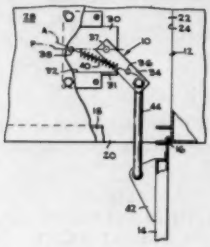
said valve rotor being connected to means adapted to rotate the valve rotor at the desired speed.

4,141,104

OVERCENTER DOOR CONTROL DEVICE

Roy O. Watson, Kokomo, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 27, 1978, Ser. No. 881,292
Int. Cl.[2] E05F *1/00*
U.S. Cl. 16—65 **10 Claims**



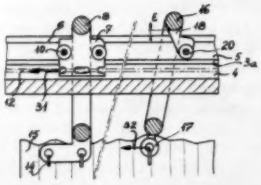
8. An overcenter door control device for a door hinged to a frame defining an opening in a compartment or the like having an upper wall, said device comprising: an abutment bracket secured to said upper wall at a point adjacent said hinge, a pivot arm, means pivoting one end of said arm to said bracket, said pivot arm pivoting about an axis lying in a plane, said plane being intermediate the range of arcuate travel of the other end of said pivot arm, stationary anchor means secured to said bracket, said pivot means and said anchor means lying in said plane substantially parallel to said opening, movable anchor means secured to said pivot arm, a tension spring connected between said stationary and movable anchor means and having a longitudinal axis, a door bracket secured to said door adjacent said hinge, linkage means pivotally interconnecting said pivot arm to said door bracket adjacent the other end of said arm, abutment means formed integrally with said abutment bracket in position to engage and stop said pivot arm in a predetermined position with a longitudinal axis of said spring on one side of said plane for resiliently holding the door in a predetermined open position, said door when moved to its closed position abutting said frame to stop said pivot arm with the axis of said spring disposed on the other side of said plane for resiliently holding the door closed.

4,141,105

CARRIER RING FOR DRAPERY ROD

Jean A. P. Gonon, Saint-Just-Malmont, France

Filed Mar. 1, 1978, Ser. No. 882,370
Claims priority, application France, Apr. 4, 1977, 77 10683
Int. Cl.[2] A47H *13/02*
U.S. Cl. 16—87.6 R **1 Claim**



1. A carrier ring for a drapery rod of the type having therethrough at least one longitudinal compartment communicating with the outside at the top, the bottom of said compartment serving as a track for the wheels of a draw ring, comprising:

a ring capable of surrounding said drapery rod;

a web, integral with the top of said ring, depending downwardly therefrom, and entering the longitudinal compartment of the rod when said ring is in position surrounding said rod; and

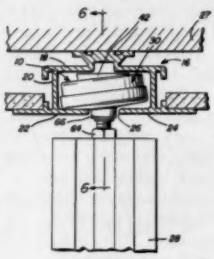
a pair of wheels, connected by an axle integral with said web, positioned to roll on the track of the longitudinal compartment of the rod when said ring is in position surrounding said rod, wherein the axis of rotation of said wheels is offset longitudinally, with respect to the transverse median plane of said ring, in a direction opposite to the draw ring when moving in a closing direction; wherein said web has a sloped forward face, in the direction of said draw ring, inclined from top to bottom toward the rear, and a projection on the rearward face thereof capable of coming into contact with the sloping forward face of the web of another said carrier ring therebehind above the axis of rotation of the wheels of the other carrier ring, when both rings are in position on the rod.

4,141,106

MULTI-DIRECTIONAL CANTED WHEEL CARRIER FOR OPERABLE WALLS

Guy E. Dixon, Miami, Fla., assignor to Panelfold, Inc., Miami, Fla.

Filed Oct. 28, 1977, Ser. No. 847,036
Int. Cl.[2] A47H *15/00*; E05D *13/02*
U.S. Cl. 16—89 **32 Claims**



1. A canted wheel carrier for movably supporting wall panels from a supporting surface, said carrier including a canted wheel having a rotational axis inclined in relation to vertical and horizontal, the angle of inclination of said rotational axis being smaller in relation to vertical than in relation to horizontal whereby a portion of the peripheral axial surface of the canted wheel is rollingly engaged with the supporting surface and the diametrically opposite portion of the wheel is spaced from the supporting surface, said carrier including support means connected with a panel.

4,141,107

HINGE CLIP

Samuel R. Sheiman, Brooklyn, and Julius Sheiman, North Woodmere, both of N.Y., assignors to Crest Lock Company, New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,088
Int. Cl.[2] E05D *3/00*
U.S. Cl. 16—128 R **8 Claims**

1. For use in forming a hinge clip that is to be employed to attach a pintle to a member, an element comprising:

(A) a flat elongated strip,

(i) said strip having a first leg and a second leg,

(ii) said legs lying in planes at right angles to each other, and

(B) an intermediate U-shaped section,

(i) said U-shaped section constituting a semicircular base,

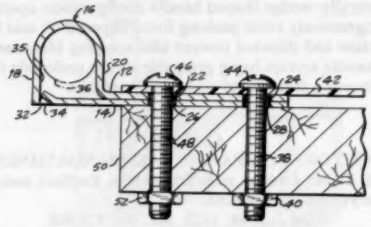
(ii) a first arm, and

(iii) a second arm,

(iv) said arms being mutually parallel to each other,

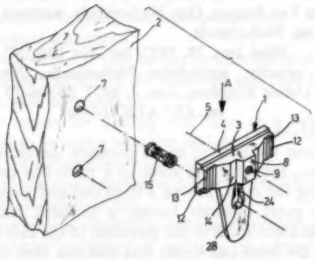
(v) said arms being unitary extensions of the ends of said base,

(C) said intermediate U-shaped section unitarily joining said first leg to said second leg,
(D) the first leg of said strip being a co-planar extension of one arm of said U-shaped section,
(E) the second leg of said strip being substantially perpendicular to the other arm of said U-shaped section,
(F) each of said first and second legs of said strip having a different opening therein,
(G) said element being bendable about the zone between said one arm and said first leg,
(H) means within said zone for locating the bend, said means being so disposed that said openings are in registration after bending,



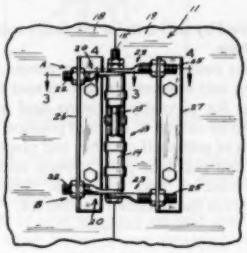
(I) said locating means including a bearing member positioned to be contacted by the inner surface of a segment of the first arm when said leg is perpendicular to the first arm whereby to act as a brace that defines and orients the first leg in perpendicular relation to the first arm, and
(J) the element, after bending around a pintle, constituting said first leg and said second leg juxtaposed in abutting relationship with said openings in registration, with said U-shaped section extending away from the proximate ends of the two legs, with the proximate ends of the two legs spaced apart lengthwise by the distance between said two arms, and with the U-shaped section extending perpendicularly away from the two juxtaposed legs, each arm of the U-shaped section in bent position of the element being perpendicular to the associated leg.

4,141,108
CABINET FITTING
Peter Busse, Vlotho, Fed. Rep. of Germany, assignor to Firma Richard Heinze, Fed. Rep. of Germany
Filed May 25, 1977, Ser. No. 800,315
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625181
Int. Cl.[2] E05D *7/04, 5/02*
U.S. Cl. 16—129 **12 Claims**



1. A furniture fitting capable of being attached to a furniture surface through engagement of a bore hole in the furniture surface, said fitting comprising:
(a) an expansion dowel having an expandable portion and a displaceble head, said expandable portion having dimensions such as to permit insertion in unexpanded state in said bore hole and being expanded by displacement of said head, and
(b) a fitting plate having a slotted face complementing said furniture surface, said slot being defined in said plate by internal edge portions having surfaces sloping obliquely from the face of said plate, said edge portions being operable to engage said displaceable head and, upon movement of said plate along said furniture surface, to displace said head relative to said expandable portion, and thereby expand said portion, as said head follows said sloping plate edge portions.

4,141,109
HINGE SUPPORT ASSEMBLY
Thurlow Farrell, 5758 N. Williamston Rd., Williamston, Mich. 48895
Filed Mar. 6, 1978, Ser. No. 883,572
Int. Cl.[2] E05D *11/00*
U.S. Cl. 16—137 **3 Claims**



1. In an adjustable hinge support assembly in association with a door mounted hinge for supportably engaging the pintle of the hinge so as to maintain it in its vertically oriented operative use position, the combination comprising:
a vertically oriented wall jamb anchor member mounted on the wall jamb adjacent the hinge;
a vertically oriented door anchor member mounted on the door adjacent the hinge in spaced-apart parallel relationship with said wall jamb anchor member;
at least one pair of oppositely extending horizontally oriented pintle-engaging support arms in association with a door hinge comprising a first pintle-engaging support arm and second pintle-engaging support arm, said first pintle-engaging support arm provided at one end thereof with a gudgeon portion defining an opening therethrough and at the opposite end thereof with a threaded wall jamb anchor-engaging portion adapted to be fixedly but adjustably connected to said wall jamb anchor member, said second pintle-engaging support arm provided at one end thereof with a gudgeon portion defining an opening therethrough and at the opposite end thereof with a threaded door anchor-engaging portion adapted to be fixedly but adjustably connected to said door anchor member, said gudgeon portions positioned in a vertically stacked abutting relationship so that said openings thereof are in vertically aligned register so as to slidably receive a pintle of a hinge therethrough so as to reinforceably retain the pintle in its vertically oriented operative use position.

4,141,110
HINGE ARRANGEMENT
Ronald G. Wanek, 423 Cleveland St., Arcadia, Wis. 54612
Filed Mar. 22, 1976, Ser. No. 669,224
Int. Cl.[2] E05D *5/02*
U.S. Cl. 16—158 **7 Claims**

1. A hinge for attaching a closure to a frame wherein said frame includes a shelf member and said closure is adapted to be moved from an open to a closed position to generally obscure

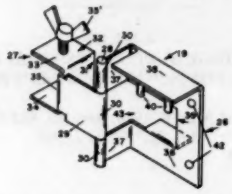
said shelf in said closed position and wherein said closure has an inside and an outside face and a series of edges comprising,

a base adapted to be attached to said closure,

said base having a face plate for engaging said inside face of said closure,

said base also having a side plate which is adapted to engage an edge of said closure and another plate at substantially right angles to both said face plate and said side plate for engaging another edge of said closure,

a bracket member including an arm,



means carried by said arm for pivotally securing said bracket to said base,

said bracket member also having means for engaging and attaching said bracket member to said shelf member,

said means for pivotally securing said arm allowing said closure to be moved to a closed position to obscure at least a portion of said shelf member and place the inside of said closure and said face plate toward said shelf member to thereby obscure said face plate when said closure is viewed from the outside face thereof.

4,141,111

ICE SCRAPER

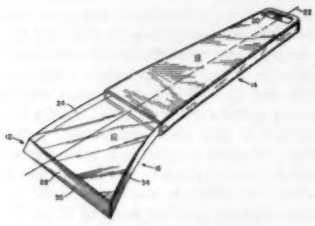
Evan L. Hopkins, Emporia, Kans., and Donald W. Cartner, Kansas City, Mo., assignors to Hopkins Manufacturing Corporation, Emporia, Kans.

Continuation of Ser. No. 687,073, May 17, 1976, Pat. No. 4,040,140. This application Jun. 20, 1977, Ser. No. 808,186

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] B60S *1/04*; A47L *17/06*

U.S. Cl. 15—236 R **2 Claims**



1. A scraper for removing ice from a surface to be scraped, said scraper comprising a body having top and bottom surfaces, said body defining:

a scraping blade at one end thereof comprising

a deflecting surface extending obliquely from said top surface toward said bottom surface, and

a scraping edge;

a handle section remote from said one end located at the extremity of the body of said scraper, said handle section having a longitudinal axis; and

an intermediate section curved to define

a convex portion of said top surface extending between said blade and said handle section, projecting below said axis, and being substantially free of obstructions to the removal of ice therefrom, and

a concave portion of said bottom surface extending between said blade and handle section below said axis;

said scraper being operable during scraping to permit force to be applied longitudinally of a surface to be scraped with the hand of the user, when gripping said handle section, remaining substantially spaced from the surface to be scraped,

with ice thrown by the deflecting action of said deflecting surface and said convex portion of said top surface being substantially deflected away from said hand of said user, and

with said deflecting surface being oblique relative to said surface to be scraped,

said handle section, on lateral edges thereof, providing a generally wedge shaped handle configuration operable to progressively resist pushing force imposed on said handle section and directed toward said scraping blade; and

said handle section being grippable on the underside thereof adjacent a free end of said handle section.

4,141,112

DOCTORS FOR PAPER-MAKING MACHINES

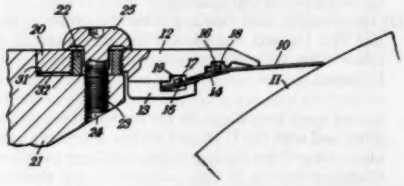
David B. Klemz, Cowden, near Edenbridge, England, assignor to Vickerys Limited, England

Filed Jan. 18, 1978, Ser. No. 870,505

Claims priority, application United Kingdom, Feb. 7, 1977, 4931/77

Int. Cl.[2] D21C *3/02*

U.S. Cl. 15—256.51 **2 Claims**



1. A doctor comprising a support, a blade holder including a tang, disposed adjacent the support, a doctor blade supported in the blade holder, the support and the tang having opposed flat surfaces, a series of spacers spaced along the length of the doctor, each of which is adjustable to vary the spacing between the said flat surfaces while maintaining them parallel, and means for securing each spacer in adjusted position.

4,141,113

PRESS FOR SEPARATING MEAT AND BONES

Theodorus Van Bergen, Oss, Netherlands, assignor to Protecon B.V., Oss, Netherlands

Filed Jun. 28, 1977, Ser. No. 810,787

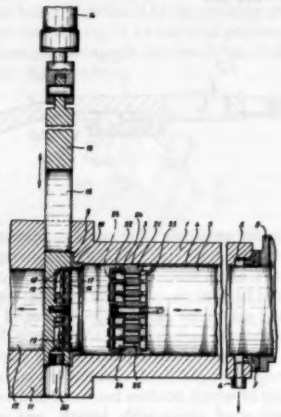
Claims priority, application Netherlands, Jun. 30, 1976, 7607187; United Kingdom, Jun. 2, 1977, 23706/77

Int. Cl.[2] A22C *17/04*

U.S. Cl. 17—1 G **17 Claims**

1. A press for putting under pressure therein animal meat with bones, reducing the meat to a paste-like condition and discharging the meat, having a front end and a rear end, comprising a press cylinder having a pressing body movable therein back and forth in the direction of the axis of the cylinder from the front end to the rear end and vice versa to exert pressure on the meat, means at the rear end of the press for moving the pressing body, the front end of said pressing body fitting in the inner wall of the press cylinder, said press cylinder having a first opening for the bones at the front end of the press, a second opening in the front end of the cylinder, a slide valve guided in said second opening, and movable up and down in a direction perpendicular to the direction of the press-

ing body, said slide valve being adapted to open and close said second opening, said valve when open allowing discharge of the bones through said first opening, a plurality of perforations in a second body mounted on said slide valve to allow passage of meat in paste-like condition, an outlet for the meat in



paste-like condition in communication with said perforations at the front end of the press, a press space in said press cylinder defined by said pressing body and said second body, said second body which has perforations being movable to allow the perforations to slide along a metal part of the press by moving the slide valve.

4,141,114

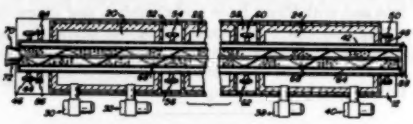
MOLLUSK SHUCKER

Harold C. Carlson, 8806 Pacific Ave, P.O. Box 826, Wildwood Crest, N.J. 08260

Filed Sep. 12, 1977, Ser. No. 832,144

Int. Cl.[2] A22C *29/04*

U.S. Cl. 17—74 **11 Claims**



1. Apparatus for opening mollusks comprising:

(a) an insulated housing,

(b) an elongated metal tube having an inlet end and an outlet end, a major portion of the length of said tube being disposed within said housing,

(c) heater means for heating said tube to a temperature sufficient to vaporize water in said tube,

(d) means for introducing water into said tube,

(e) motor means connected to said tube for rotating said tube about its longitudinal axis,

(f) conveyor means in said tube and spaced radially inwardly from the inner periphery of said tube for supporting mollusks in spaced relation to the tube inner periphery and for moving mollusks along said tube while enabling the mollusks to be subjected to steam created in said tube by vaporization of water in said tube, and

(g) a hopper communicating with said conveyor means adjacent said tube inlet end for feeding mollusks to said conveyor means.

4,141,115

METHOD AND APPARATUS FOR CUTTING TEXTILE TOW INTO STAPLE

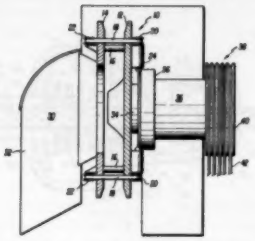
Franz Fourne, and Ursula Fourne, both of Kiefernweg 30, D-5300 Bonn, Fed. Rep. of Germany

Continuation of Ser. No. 622,506, Oct. 15, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,282

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1974, 2456941

Int. Cl.[2] D01G *1/04*

U.S. Cl. 19—.6 **25 Claims**



1. A process for cutting textile tow into staple comprising the steps of:

(a) winding a strand of textile tow upon a rotating textile tow support demarcating an interior in a direction generally parallel to the direction of rotation of said support to form an inner layer of tow wrapped on said tow support and one or more outer layers of tow wrapped on top of said inner layer, said tow being under tension to cause an inward pressure to be exerted solely by said tow against said tow support;

(b) cutting said strand of textile tow into staple with a plurality of cutting surfaces which face radially outward and which contact the innermost layer of tow, by non-radial movement of each of said cutting surfaces transversely to said direction of winding of said tow upon said support and by an opposite non-radial transverse movement of the next adjacent cutting surface to increase tension on the tow between said adjacent cutting surfaces, thereby to improve cutting and cut the tow into pieces of staple; and

(c) removing said staple from the interior of said tow support and away from said cutting surfaces.

4,141,116

SNAP SWIVEL FOR FISHING TACKLE

Victor J. Zalonis, 9 Holiday Ave., Hatfield, Pa. 19440

Filed Mar. 1, 1978, Ser. No. 882,404

Int. Cl.[2] A44G *13/02*

U.S. Cl. 24—73 HR **8 Claims**

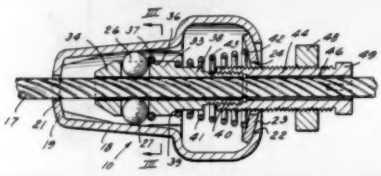
1. A snap-swivel for fishing equipment comprising a first snap member consisting of a resilient flat band of uniform width which is rectangular in cross section and has opposite flat broad surfaces and which has three acute angle bends on the same side thereof, two terminal end portions overlapping to form a closed but openable approximate triangle, one of the sides of said triangle serving as a flat base and having a hole therethrough, and a second snap member which comprises a normally closed but openable hook which is connected to the first snap member by a swivel pin which is rotatably located in said hole and has a head with a flat under face which bears on

said flat base so that the second snap member is freely rotatable but is retained against endwise displacement therefrom.

4,141,117
RELEASING TOOL FOR USE WITH A RELEASABLE CONE LOCK

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Jun. 9, 1977, Ser. No. 804,935
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—136 R **2 Claims**

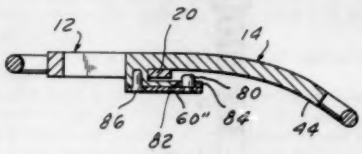


1. A removable release tool for use with a cone lock;
the cone lock having a hollow body member closed by an end plate with a centered opening with a cable receivable therethrough and a spring biased movable retainer mounted in the body member operable to permit the cone lock to slide in a first direction with respect to the cable received therethrough and operable to block the cone lock from sliding opposite to the first direction, an engaging means being mounted on the spring biased movable retainer and accessible through the centered opening of the end plate;
the removable release tool comprising: a hollow shaft with a threaded external surface;
a cylindrical handle portion having an axial bore therethrough with a handle mounted transversely thereto at a first end, with a collar affixed at a second end, said collar having a threaded internal boring sharing a common center line with said axial boring through said handle portion;
a first and a second sleeve each having an axial boring therethrough joined by a longitudinal portion with said first sleeve having a first and a second end surface, said first and said second sleeves being joined by said longitudinal portion so as to have a common center line with respect to said interior borings with said first and said second end surfaces being substantially perpendicular thereto;
said cylindrical handle portion being rotatably mounted within said axial boring of said second sleeve with said collar surface being positioned adjacent to said second end surface of said first sleeve;
said hollow shaft being threaded into said threaded internal boring in said collar of said cylindrical handle portion and passing through said boring in said first sleeve;
whereby the cone lock may be released by positioning the cable clamped by the cone lock within said axial boring of said cylindrical handle portion and within said hollow shaft with said first end surface of said first sleeve adjacent to the end plate, said threads of said hollow shaft engaging the spring biased movable retainer within the cone lock and the spring biased movable retainer being moved opposite to the first direction, thereby releasing the cone lock, by the rotation of said cylindrical handle portion which threadably engages said hollow shaft causing said hollow shaft to move opposite to the first direction while said collar surface of said cylindrical handle portion bears against said second end surface of said first sleeve and said second end surface of said first sleeve bears against the end plate of the cone lock.

4,141,118
HOOK AND RING CLASP

Gary Gudell, Commack, N.Y., assignor to Jacoby-Bender, Inc., Woodside, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,222
Int. Cl.[2] A44B *13/02*
U.S. Cl. 24—201 HE **9 Claims**



1. A clasp for an article of jewelry comprising:
A. an elongated rigid ring element comprising a front part, a back part, and a spaced pair of side parts connecting said front and back parts, said parts together defining an aperture, and said front part being of reduced thickness relative to said side parts with the top surface thereof disposed below the plane of the top surfaces of said side parts;
B. an elongated rigid hook element having a body portion the front of which doubles back and underneath to form a lip portion of appreciable length, and a generally U-shaped part-receiving chamber having its base at the front of said hook element, said lip portion being configured and dimensioned to pass through said aperture and spaced below said body portion sufficiently to receive therebetween the thickness of said front part of said ring element; said hook and ring elements when assembled together disposed to form said clasp having said front part of said ring element disposed in said chamber of said hook element;
C. an elongated catch member having a front end fixedly mounted on the front of said hook element and a back end defining an upwardly extending detent, said detent being biased upwardly and movable between a locking position wherein said detent operatively closes the back of said chamber to preclude withdrawal of said front part therefrom and an unlocking position wherein said detent is depressed by said front part to operatively open the back of said chamber and enable said front part to be inserted into and withdrawn from said chamber, said detent being configured and dimensioned to be automatically moved from said locking position into said unlocking position by the movement of said front part thereover during separation of said hook and ring elements.

4,141,119
PLASTIC CLIP

Taizo Nodo, Nishinomiya, Japan, assignor to Kohshoh Limited, Kyoto, Japan

Filed Jan. 10, 1978, Ser. No. 868,340
Claims priority, application Japan, Sep. 14, 1977, 52-111110
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—250 **6 Claims**

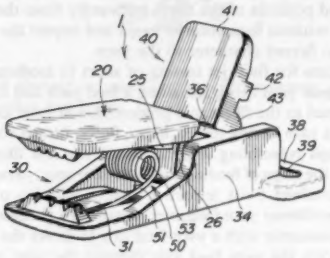
1. A plastic clip comprising upper and lower clip members having clipping portions for clipping an article therebetween, an operative member for moving the clipping portions of the upper and lower clip members between open and closed positions, and a resilient member for biasing the clipping portions of the upper and lower clip members into the open position, the lower clip member comprising:
a substantially flat plate having a rear portion and a pair of sides, the rear portion having an opening therethrough,
a pair of supporting portions integrally extended upwardly from both sides of the rear portion of the plate, and
a pivotal element at the upper portion of each supporting portion which projects toward the other supporting por-

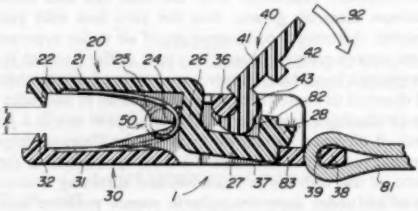
tion and in which at least the lower surface is arched, the upper plate member comprising:

a main plate having a rear end,

a wall extending downwardly from the rear end portion of the main plate, and

a subplate extending from the lower end portion of the wall rearwardly and substantially parallel with the main plate, the subplate being positioned in the opening of the lower clip member and having at its rear end portion an engaging portion engageable with the rear edge of the opening of the lower clip member,





the operative member comprising:

an operative arm and a receiving element provided at the front portion of the arm which engages the pivotal elements of the lower clip member to provide a pivotal connection therebetween, the lower surface of the receiving element engaging the upper surface of the subplate of the upper clip member and functioning as a sliding surface slidable at least on the upper surface of the subplate, the front portion of the receiving element being located in the space defined between the wall of the upper clip member and the pivotal elements.

4,141,120

APPARATUS FOR CONTROLLING THE MOVEMENTS OF A REED CARRIAGE DURING WARPING

Kurt Schenk, Degersheim, Switzerland, assignor to Maschinenfabrik Benninger AG, Uzwil, Switzerland

Filed Dec. 12, 1977, Ser. No. 859,646

Claims priority, application Switzerland, Dec. 17, 1976, 15889/76

Int. Cl.[2] D02H *13/26*

U.S. Cl. 28—185 **10 Claims**

1. An apparatus for controlling the movements of a reed carriage carrying a reed of a warping machine during warping a package from warp sections wound in succession next to one another upon the warping drum of the warping machine, comprising:

a warping drum upon which there are wound the warp sections;

a reed carriage cooperating with the warping drum for winding the warp sections thereon;

a reed carried by said warping carriage;

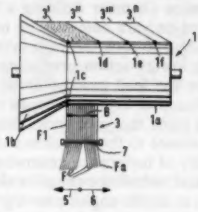
a reed carriage-displacement spindle for displacing the reed carriage in order to produce shifted depositions of the layers of the warp sections during the winding operation;

pre-settable change-speed gearing for driving the spindle as a function of the rotation of the warping drum;

a processor provided for the warping machine;

means for infeeding data relevant to the displacement of the reed carriage during winding of a warp section;

said processor calculating on the basis of the infed data relevant to the displacement of the reed carriage during the winding of a warp section containing a predetermined number of threads the required number of revolutions of the reed carriage-displacement spindle;



means for infeeding further data to the processor regarding the warp sections to be wound;

said processor calculating on the basis of said further data the number of revolutions of the reed carriage-displacement spindle needed to be accomplished in the opposite rotational sense in order to displace the reed carriage-displacement spindle, following completion of the winding of a warp section, back into a starting position for the winding of the next warp section;

said processor delivering upon recall signals;

means responsive to said signals emitted by the processor for initiating the return displacement of the reed carriage.

4,141,121

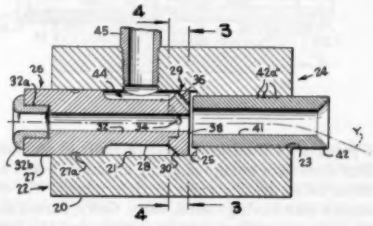
APPARATUS FOR PRODUCING FLUID JET TEASED YARNS FROM SHORT/MEDIUM STAPLE MULTIFIBER SPUN YARNS

Alexander L. Trifunovic, Burlington, N.C., assignor to Glen Raven Mills, Inc., Glen Raven, N.C.

Continuation-in-part of Ser. No. 752,876, Dec. 13, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,406

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—271 **26 Claims**



1. Apparatus for fluid jet teasing of short to medium staple multifiber spun yarn by impinging pressurized fluid jets on the spun yarn being fed along a feed path to produce vortex and turbulence effects at fluid jet stations serially arranged along the feed path and disarranging end portions of the fibers outwardly from the yarn axis producing a yarn having teased, hairy, fluffy, fuzzed character without loops resembling angora, alpaca and the like yarns, the spun yarn fed to the apparatus having a twist imparted to the fibers in a predetermined twist direction, the apparatus comprising an elongated housing

having inlet and outlet ends to be positioned along the feed path for passage of the yarn with predetermined overfeed therethrough along a yarn feed axis, the housing having means therein defining an inlet yarn passage extending axially therethrough from the inlet end to an intermediate portion of the housing, means in said housing defining a turbulence chamber of larger diameter than said inlet yarn passage at said intermediate portion of the housing communicating with said inlet yarn passage, means defining an outlet yarn passage axially aligned with the inlet yarn passage and having a smaller diameter than the turbulence chamber for passage of yarn from the turbulence chamber through the outlet end of the housing, means defining a first vortex generating fluid jet passage communicating with said inlet yarn passage immediately upstream from said turbulence chamber defining a fluid vortex station for exerting forces on yarn entering the inlet end of the inlet yarn passage tending to suck the yarn into the inlet yarn passage and causing vortex action producing rotating forces on the yarn fibers in the feed passage about the yarn axis in a predetermined direction to tend to open up the fibers of the twisted yarn and place the yarn under fluid vortex positional control at the entrance to the turbulence chamber, and means defining a plurality of turbulence generating fluid jet passages opening up into said turbulence chamber along axes inclined to the yarn feed axis at similar angles converging in a downstream direction to create turbulent fluid forces in the turbulence chamber causing further opening and outward distortion of the yarn fibers to produce the teased, hairy, fluffy, fuzzed not-looped appearance, and means supplying pressurized fluid to said vortex generating fluid jet passage and to said turbulence generating jet passages.

4,141,122

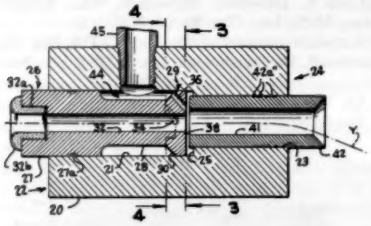
PROCESS FOR PRODUCING FLUID JET TEASED, FLUFFY, HAIRY YARNS FROM SHORT/MEDIUM STAPLE MULTIFIBER YARNS

Alexander L. Trifunovic, Burlington, N.C., assignor to Glen Raven Mills, Inc., Glen Raven, N.C.

Division of Ser. No. 821,406, Aug. 3, 1977, which is a continuation-in-part of Ser. No. 752,876, Dec. 13, 1976, abandoned. This application May 8, 1978, Ser. No. 903,922

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—271 **10 Claims**



1. A process for fluid jet teasing of short to medium staple multifiber spun yarn being fed along a feed path and having a twist imparted to the fibers in a predetermined twist direction to produce a yarn having teased, hairy, fluffy, fuzzed character without loops resembling angora, alpaca and the like yarns, comprising the steps of feeding the spun yarn with an overfeed through a rectilinear yarn feed inlet passage of a predetermined diameter concentric with a yarn feed axis to direct the path of the yarn along the yarn feed axis through the inlet passage, feeding the yarn from said inlet passage directly into a turbulence chamber concentric with the feed axis and having a maximum diameter greater than the yarn feed inlet passage diameter, directing a continuous jet of air under superatmospheric source pressure through an exit orifice located in said inlet passage immediately upstream of said turbulence chamber and directed to cause fluid vortex conditions in said inlet passage producing rotating forces about the yarn axis in a direction opposite the twist direction of the spun yarn to tend to open up the fibers of the twisted spun yarn, and directing continuous jets of air under superatmospheric source pressure into the turbulence chamber through exit orifices located in an upstream boundary surface of the turbulence chamber located at plural circumferentially spaced positions outwardly of said inlet passage about the yarn feed axis and spaced radially inwardly from the largest diameter portion of the turbulence chamber to impinge on the yarn being fed therethrough, and feeding the yarn from said turbulence chamber through a rectilinear yarn feed outlet passage concentric with the yarn feed axis and the extended center axis of said inlet passage to tease the end portions of the fibers outwardly from the center of the yarn without formation of loops and impart the teased, hairy, fluffy, fuzzed character to the yarn.

8. A process for fluid jet teasing of short to medium staple multifiber spun yarn being fed along a feed path and having a twist imparted to the fibers in a predetermined twist direction to produce a yarn having teased, hairy, fluffy, fuzzed character without loops resembling angora, alpaca and the like yarns, comprising the steps of feeding the multifiber spun yarn having the predetermined twist imparted thereto with an overfeed through a rectilinear yarn feed inlet passage of a predetermined diameter concentric with a yarn feed axis to direct the path of the yarn along the yarn feed axis through the inlet passage, feeding the yarn from said inlet passage directly into a turbulence chamber concentric with the feed axis and having a maximum diameter greater than the yarn feed inlet passage diameter, directing a continuous jet of air under superatmospheric source pressure through an exit orifice located in said inlet passage immediately upstream of said turbulence chamber and directed to cause fluid vortex conditions in said inlet passage producing rotating forces about the yarn axis in a predetermined direction to tend to open up the fibers of the spun yarn and place the yarn under fluid vortex control at the entrance of the turbulence chamber, and directing continuous jets of air under superatmospheric source pressure into the turbulence chamber through exit orifices located in an upstream boundary surface of the turbulence chamber located at plural circumferentially spaced positions outwardly of said inlet passage about the yarn feed axis and spaced radially inwardly from the largest diameter portion of the turbulence chamber to impinge on the yarn being fed therethrough, and feeding the yarn from said turbulence chamber through a rectilinear yarn feed outlet passage concentric with the yarn feed axis and the extended center axis of said inlet passage to tease the end portions of the fibers outwardly from the center of the yarn without formation of loops and inpart the teased, hairy, fluffy, fuzzed character to the yarn.

4,141,123

METHOD OF MANUFACTURING A SPRING HINGE

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

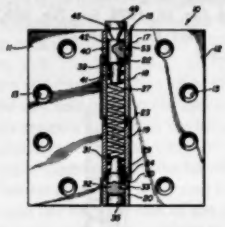
Division of Ser. No. 749,793, Dec. 13, 1976, Pat. No. 4,102,013. This application Dec. 12, 1977, Ser. No. 859,337

Int. Cl.[2] B21D *53/40*; B21K *13/02*

U.S. Cl. 29—11 **4 Claims**

1. A method of assembling a door hinge providing torsional action between its leaves, the method comprising the steps of aligning a pair of hinge leaves, each leaf defining at least one hollow hinge knuckle so that the hinge knuckle on a first leaf is axially aligned with the hinge knuckle defined on the opposite leaf, inserting a torsion spring mechanism through the axially aligned hinge knuckles, affixing a first end of the spring mechanism with respect to a first hinge leaf, inserting a plug into a second spring mechanism end which plug includes a frangible tool engageable head portion joined to the main portion thereof, applying a pre-determined amount of torque to said head portion of the plug, and resultantly, to the spring mechanism, fixing the torqued plug with respect to the second

leaf, thereafter further torquing the plug head portion so as to fracture said head portion away from the main portion of the



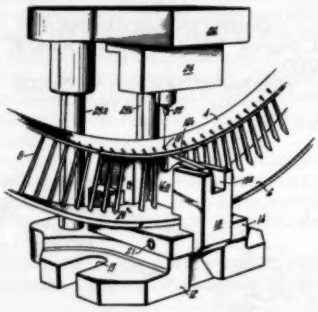
plug, and thereafter removing the broken-away plug head from the plug and hinge.

4,141,124

METHOD AND APPARATUS FOR REMOVING ONE OR MORE VANES FROM A GAS TURBINE COMPRESSOR STATOR

Edward J. Ryan, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 29, 1977, Ser. No. 828,370
Int. Cl.² B23P *19/04, 7/00*
U.S. Cl. 29—427 **17 Claims**



1. A method for removing a vane from a gas turbine compressor stator wherein the stator includes a plurality of vanes fixtured between concentric inner and outer cylindrical shroud members, the opposite ends of each vane being metallurgically attached in slots through the shroud members such that the longitudinal axis of each vane is radially aligned relative to the shroud members, comprising:

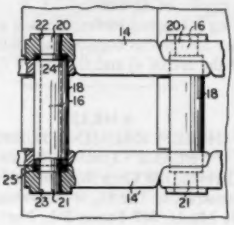
punching one of the attached ends of the vane in the radial direction relative to the concentric shroud members with sufficient force to shear the metallurgical joints holding the vane in the inner and outer shroud slots while, during punching, said shroud members are supported against radial deformation in the vicinity of said vane ends and the vane is laterally supported to prevent buckling thereof, shearing of the metallurgical joints freeing the vane for removal.

4,141,125

METHOD OF MOUNTING TRACK PIN

Dennis L. Blunier, Danvers, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 644,372, Dec. 24, 1975, abandoned. This application Dec. 6, 1977, Ser. No. 857,949
Int. Cl.² B21H *7/00*; B21K *19/00*
U.S. Cl. 29—148.3 **2 Claims**



1. A method of mounting a metallic track pin to a metallic track link, wherein the metallic track pin is comprised of a metallic material which undergoes a volumetric expansion upon heating and retains the volumetric expansion upon quenching, comprising;

press-fitting an end of the pin in a bore defined by the link;

heating the pin adjacent said end positioned in said bore to cause a volumetric increase of the end of the pin; and

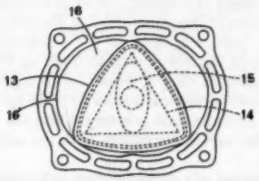
quenching the pin adjacent said end, whereby a volumetric increase of the end of the pin remains, to secure the pin relative to the track link.

4,141,126

METHOD OF MAKING A ROTARY ENGINE ROTOR AND BEARING STRUCTURE

Fukumatsu Okada, 4-151, Umemori-zaka, Ueda, Tenpaku, Meito-ku, Nagoya-shi, Japan

Continuation of Ser. No. 673,367, Apr. 5, 1976, abandoned. This application Aug. 4, 1977, Ser. No. 821,816
Claims priority, application Japan, May 28, 1975, 50-63855
Int. Cl.² B23P *15/00*; F01C *1/02*
U.S. Cl. 29—156.4 R **5 Claims**



1. A method of making a rotary engine internal bearing surface for rotatably supporting a rotor having three apexes and internal bearing surfaces in the shape of a regular triangle, wherein the rotor rotates within a combustion chamber casing having an internal surface conforming to a two arch epitrochoidal line, according to the steps of:

(a) constructing three circles having a predetermined and equal radius centering around each of the respective apexes of the rotor regular triangle bearing surface;

(b) constructing three lines each internally parallel to a side of said triangle and tengential to the respective circles;

(c) constructing an arc of a circle centering around one of the three intersecting points of two of the three parallel lines, which arc is tangential to one of the parallel lines opposite the arc centering point;

(d) constructing two circles each having a radius equal to that of the radius of the three circles having predeter-

mined radii, each of said two circles centering around one of the two intersecting points of said arc of a circle with an internally parallel line;

(e) connecting said two circles d) by an arc of a circle centering around the intersecting point of c) and tangentially contacting a side of said rotor regular triangle bearing surfaces;

(f) constructing an arc of a circle having a radius equal to that of said arc of a circle of e), symmetrically connecting said two circles of d); and

(g) fabricating a bearing surface having a cross section following the continuous outside path defined by the circles of d) and the arc of e) and the arc of f).

4,141,127

METHOD OF REFURBISHING TURBINE VANE OR BLADE COMPONENTS

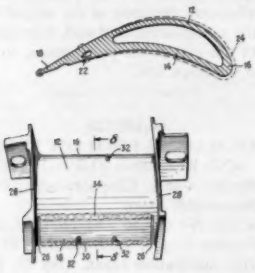
Salvatore J. Cretella, 180 Fitch St., North Haven, Conn. 06473; Matthew Bernardo, 62 Lee St., West Haven, Conn. 06516, and Ralph T. De Musis, 547 Foxon Rd., North Branford, Conn. 06471

Continuation-in-part of Ser. No. 613,479, Sep. 15, 1975, Pat. No. 4,028,787. This application Nov. 26, 1976, Ser. No. 745,166

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.[2] B23P *15/02, 7/04*

U.S. Cl. 29—156.8 B **7 Claims**



1. The method of refurbishing a turbine component, which includes the steps of welding cracks in the component surface, slitting portions of the component at the two ends of the trailing edge to relieve stresses in the component, welding the trailing edge of the component to build up the same, welding the slitted portions closed, plasma spraying molten metal on eroded surfaces of the component to build up the same beyond the original surfaces, and grinding down the built-up surfaces to refinish the same to conform with the original component surfaces.

7. The method of refurbishing an airfoil-shaped metal alloy turbine part having a composition containing substantial quantities of cobalt, with silicon present in an amount substantially of several percent, comprising the steps of mixing a preparation of an overlay metal alloy comprising substantially the same respective amount of cobalt as contained in said turbine part and with silicon present in an amount substantially of several percent, adding to said preparation an amount of silicon on the order of 10% or more of the silicon content of the preparation, converting said preparation and added silicon into a molten alloy, applying said molten alloy to the eroded surfaces of the airfoil of the part to build-up the same beyond its original surface and sintering the part in a furnace at a temperature above 2,000° F. while burning off substantially all of the added silicon contained in the molten alloy that was applied to said part such that the resultant overlay alloy has substantially the same composition as the turbine part, removing and cooling the turbine part, and grinding the overlay surface of the airfoil of the part to restore the dimensions thereof substantially to those of a new part.

4,141,128

FILTER BAG CAGE

Harold J. Wonderling, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,722

Int. Cl.[2] B23P *15/16*

U.S. Cl. 29—163.5 F **6 Claims**

1. The method of manufacturing an elongate cage type support for a tubular filter bag comprising the steps of axially aligning a pair of annular thimble members wherein each is provided with a plurality of apertures that extend radially therethrough, positioning a contracted tension spring intermediate said thimble members, linking each end of the tension spring to a thimble member lying adjacent thereto, spacing the thimble members apart to extend the tension spring therebetween, positioning a plurality of elongate ribs longitudinally between aligned apertures in the spaced thimble members to hold said thimble members apart while they are biased continuously by the extended coil spring, and placing a fabric filter member over the elongate cage to provide a rigid filter element between spaced thimble members.

4,141,129

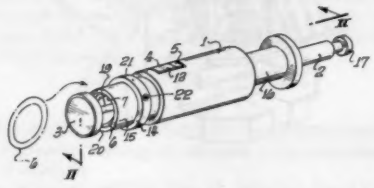
O-RING INSERTION TOOL

Leonard J. Martini, 2801 Ocean Front Walk, F, San Diego, Calif. 92109

Filed Sep. 27, 1976, Ser. No. 722,226

Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—235 **4 Claims**



1. A tool for inserting an O-ring into a female O-ring groove within a bore comprising:

a syringe-like barrel for receiving the O-ring and capable of being inserted into the bore to a selected depth;

means connected to the barrel for forming an annular space at the end of the barrel;

plunger means slidable within the barrel for ejecting the O-ring seal out of the annular opening and into the O-ring groove within the bore;

a stem extending forward beyond a forward open end of the barrel, and

a disk-like mandrel axially connected to the forward end of the stem;

said mandrel being slidable within the bore containing the female O-ring groove and so that the foward extension of

the stem can position the mandrel just beyond the female groove within the bore;

a pair of brackets;

said stem extending axially through the forward end of the plunger means and fixedly mounted to the brackets;

the ejecting means being a plunger which has an elongated transverse slot;

said brackets slidably extending through the plunger means within the slot and fixed to the barrel so that the plunger means can reciprocate within the barrel between forward and aft positions within the limits of the slot whereby an O-ring can be disposed from the barrel cavity and inserted into the female groove by squeezing the O-ring beteen the mandrel and the forward end of the plunger means;

a rectangular slot through the barrel of size to contain said brackets;

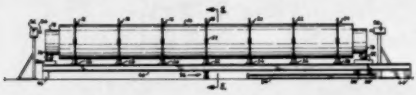
said stem having threaded end screwed through forward bracket and bearing against aft bracket, thus separating the two brackets and frictionally fixing them within the rectangular slot in the barrel.

4,141,130

METHOD AND APPARATUS FOR CENTERING TWO CONCENTRIC CYLINDERS

Milburn L. Hart, La Marque, Tex., and John F. Bridge, Worthington, Ohio, assignors to H. C. Price Co., Bartlesville, Okla.

Filed Dec. 5, 1977, Ser. No. 857,088
Int. Cl.[2] B21C *51/00*
U.S. Cl. 29—407 **29 Claims**



1. A method for centering two concentric cylinders having different diameters, said method comprising the steps of:

positioning the cylinder having the smaller diameter within the cylinder having the greater diameter so that the ends of said cylinder having a smaller diameter are centered with respect to the cylinder having a greater diameter;

establishing a linear reference line along the length of one cylinder;

rotating said one cylinder about its center point;

determining the arcuate displacement of said one cylinder by detecting the deviation of said one cylinder from said reference line as the cylinder is rotated about its center point; and

arcuately displacing the other cylinder to conform with the determined displacement of said one cylinder.

4,141,131

APPARATUS AND METHOD FOR BUTTONING GARMENTS

Nils L. Johansson, Ganghester, Sweden, assignor to AB Calator, Boras, Sweden

Filed Sep. 29, 1977, Ser. No. 838,027
Claims priority, application Sweden, Sep. 30, 1976, 7610895; Aug. 11, 1977, 7709073
Int. Cl.[2] A41H *43/00*
U.S. Cl. 29—428 **23 Claims**

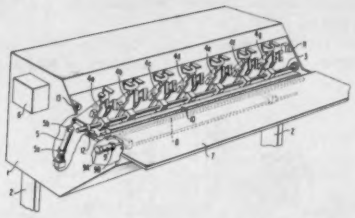
1. Apparatus for automatically buttoning a garment such as a shirt comprising:

retaining means for retaining the bottonhole strip of the garment in a fixed position during the buttoning operation;

support means for supporting the button strip of the garment relative to the buttonhole strip,

at least one hook means associated with a respective button and buttonhole,

insert means for inserting said at least one hook means through the buttonhole into engagement with the button,



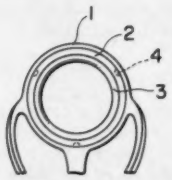
and means for rotating said hook means into position surrounding the button and for withdrawing said hook means and the button engaged thereby through the buttonhole.

4,141,132

METHOD OF MANUFACTURING A LINE GUIDE RING FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

Filed Nov. 2, 1977, Ser. No. 848,014
Int. Cl.[2] B23P *11/00*; A01K *87/04*
U.S. Cl. 29—432 **3 Claims**



1. A method of manufacturing a line guide ring assembly for fishing rods comprising fitting an elastic shock ring into a fixed ring, said fixed ring having an inner periphery formed with at least two inwardly directed prongs, and pressing a guide ring into said shock ring, said guide ring having an outer diameter larger than the inner diameter of said shock ring, said guide ring thereby enlarging said shock ring and causing said prongs to pierce said shock ring to hold the rings in an assembled condition.

4,141,133

TOOL CHANGER FOR VERTICAL BORING MACHINE

Claude M. Grinage, Stratford, Conn., assignor to The Bullard Company, Bridgeport, Conn.

Division of Ser. No. 609,429, Sep. 2, 1975, Pat. No. 4,084,462, which is a continuation-in-part of Ser. No. 506,584, Sep. 16, 1974, Pat. No. 4,038,740. This application Sep. 12, 1977, Ser. No. 832,404
Int. Cl.[2] B23Q *1/55*
U.S. Cl. 29—568 **11 Claims**

1. A carousel assembly for holding a plurality of tool blocks, where the blocks are formed with upwardly opening clamping slots extending from side to side, which comprises

(a) a rotatable turntable,

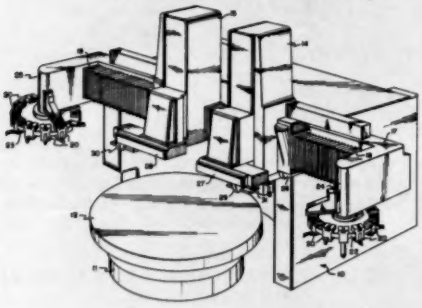
(b) said turntable having a plurality of radially projecting tool block supporting elements, each adapted for slidable reception in the clamping slot of a tool block,

(c) recess means in said tool block supporting elements accommodating the simultaneous presence in said clamping slots of one of said supporting elements, and a second

tool block engaging means for engaging and transporting a tool block from said turntable,

(d) a tool block transport means cooperatively associated with said turntable and including said second tool engaging means,

(e) said transport means being movable, when carrying a tool block into engagement with one of said supporting



elements, to a predetermined tool pick-up position radially inside of a supported tool block, with respect to the axes of said turntable, and

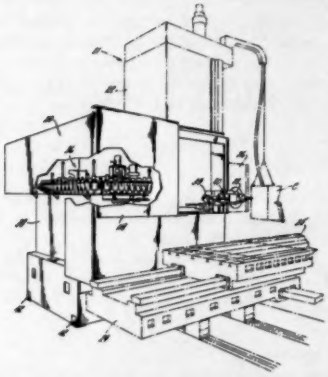
(f) said turntable being rotatable while said tool transport means remains in said pick-up position to bring a new tool block into a predetermined pick-up position, in alignment with said tool transport means.

4,141,134

TOOL CHANGER ATTACHMENT FOR MULTI-FUNCTION MACHINE TOOLS

William D. Zettler; Edward F. Woytych; Daniel J. Seichter, and Frederick L. Schmidt, all of Fond du Lac, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Sep. 7, 1976, Ser. No. 721,096
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



1. An automatic tool changer attachment for a horizontal spindle multi-function machine tool including a column, a headstock and a spindle in said headstock, said attachment comprising, in combination:

(a) a tool storage magazine having a plurality of toolholder pots;

(b) an independent base spaced apart from said machine tool in general alinement with the column but offset to the rear of the headstock face and on the side of the column remote from the operator's station;

(c) a shuttle track interposed between said magazine and said headstock;

(d) a shuttle mounted for reciprocating movement along said track;

(e) a two handed rotary tool exchange arm mounted on said shuttle;

(f) means for rotating said tool exchange arm;

(g) means on said tool exchange arm for gripping toolholders;

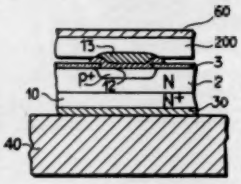
(h) means for axially moving said tool exchange arm normal to the plane of said arm selectively in a horizontal direction parallel to the spindle axis adapting said arm to exchange tools with said spindle, and in a vertical direction parallel to the axes of said magazine pots adapting said arm to exchange tools with said magazine.

4,141,135

SEMICONDUCTOR PROCESS USING LAPPED SUBSTRATE AND LAPPED LOW RESISTIVITY SEMICONDUCTOR CARRIER

Raymond Henry, and Jean-Victor Bouvet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 12, 1976, Ser. No. 731,213
Claims priority, application France, Oct. 14, 1975, 75 31411
Int. Cl.[2] H01L *21/304, 23/36*
U.S. Cl. 29—580 **3 Claims**



1. A process for producing semiconductor devices of planar diode type, with a very low thermal resistance, starting from a wafer consisting of a substrate, at least one active layer of semiconductor material exhibiting electrodes and a metal coating, said process comprising the following steps:

(a) bonding of a block of low resistivity semiconductor material onto said active part;

(b) lapping of said substrate;

(c) finishing the device according to the following sub-steps:

(c_1) depositing a first layer of highly heat conductive metal onto the lapped substrate;

(c_2) depositing a second layer of low resistivity metal onto said first layer;

(c_3) lapping of the block;

(c_4) metallising the lapped block surface by a highly heat conductive metal.

4,141,136

METHOD OF FABRICATING SEMICONDUCTOR DEVICES WITH A LOW THERMAL RESISTANCE AND DEVICES OBTAINED BY THE METHOD

Raymond Henry, and Philippe Morel, both of Paris, France, assignors to Thomson-CSF, Paris, France

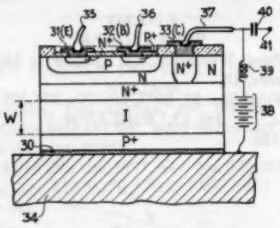
Filed Feb. 8, 1977, Ser. No. 766,666
Claims priority, application France, Mar. 11, 1976, 76 06904
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—590 **3 Claims**

1. A method of fabricating semiconductor devices of the type including a semiconductor region constituting the active portion, the functioning of which leads to the dissipation of calories, a semiconductor substrate, and an electrically insulating support for the active portion intended to carry off the

calories toward a heat sink by thermal conduction, the method comprising the following steps:

providing a disk of high resistivity semiconductor material;

creating, by diffusion or epitaxy, a pair of highly doped zones of mutually opposed types of conductivity respectively on the two large faces of the disk, leaving therebetween a layer of high resistivity semiconductor material with which the zones form a diode of the "PIN" type;



epitaxially growing a semiconductor layer of the same conductivity type but less strongly doped than one of the zones, starting from the zone;

selectively diffusing impurities into the semiconductor layer to produce a plurality of semiconductor devices;

depositing a metallic film to facilitate connection of the devices to external circuits;

separating the individual devices by cutting up the disks; and

mounting each device on a heat-dissipating support.

4,141,137

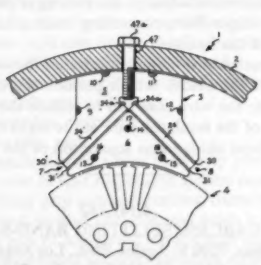
METHOD OF MAKING A PERMANENT MAGNET FIELD POLE FOR A DIRECT CURRENT DYNAMOELECTRIC MACHINE

Frank T. De Wolf, and Dan W. Kimberlin, both of Erie, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,457

Int. Cl.² H02K *15/02*

U.S. Cl. 29—596 **6 Claims**



1. A method of manufacturing a dynamoelectric permanent magnet machine field pole comprising the steps of:

a. making a rigid laminated pole base member by stacking a plurality of pre-formed base member lamina and welding them together,

b. making a relatively more flexible laminated pole face member by stacking a plurality of pre-formed face member lamina and securing them together by inserting a plurality of rods through aligned apertures in the lamina and positioning lamina-holding means on opposite ends of the rods,

c. making at least one rare earth magnet sub-assembly, each of said at least one sub-assembly having a plurality of bar magnets mounted between a pair of magnetically permeable metal plates, and

d. adhering the base member to one metal plate of at lest one magnet sub-assembly and adhering the pole face member to the other metal plate of said magnet sub-assembly.

4,141,138

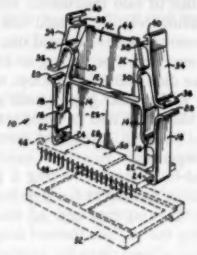
TOOL FOR INSERTING AND EXTRACTING INTEGRATED CIRCUITS

Gary K. Quick, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed May 31, 1977, Ser. No. 801,805

Int. Cl.² H05K *3/30*

U.S. Cl. 29—740 **9 Claims**



1. A tool for assisting in the insertion of an integrated circuit on a circuit board and the extraction of same from the circuit board, said tool comprising:

a frame;

a pair of spaced apart levers for engaging and releasing the integrated circuit each lever having a gripping portion and a movement imparting portion;

gripping means on each lever for gripping opposite ends of the integrated circuit to facilitate insertion and extraction of same, said gripping means being located at the gripping portion of each lever; and

a hinge connection associated with each lever, said hinge connection being operable to couple its associated lever in spaced apart relationship with the frame such that the gripping portion and the movement imparting portion of the lever extend outward from said hinge connection in opposite directions and to allow its associated lever to pivot about the hinge connection in response to a force applied to the movement imparting portion of the lever.

4,141,139

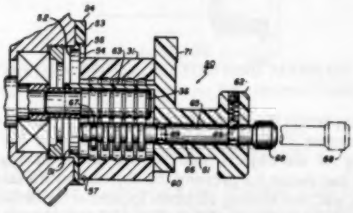
TOOL FOR ASSEMBLING ELECTRICAL CONTACT ASSEMBLY

Peter E. Jacobson, and Terry S. Allen, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 759,298, Jan. 14, 1977, Pat. No. 4,068,909. This application Aug. 26, 1977, Ser. No. 828,127

Int. Cl.² H01R *43/00*

U.S. Cl. 29—755 **3 Claims**



1. For use with a contact assembly for conducting electrical energy between a pair of coaxial instrument members relatively rotatable about an axis thereof of the type comprising a plurality of inner and outer circular, coaxial, coplanar electrically conductive rings, one group of said rings being disposed

on one of said members and the other group of said rings on the other of said members for relative rotation about said axis, the respective diameters of said rings providing a relatively large radial gap therebetween and a plurality of resilient, filamentary, electrically conductive loops having a free diameter greater than the radius of said gap and normally compressed between the rings whereby the loops roll on the ring surfaces upon relative rotation between the instrument members, the assembly further comprising inner and outer cylindrical support members for the inner and outer rings and carried by said instrument members, one support member being radially fixedly mounted on one of said instrument members relative to said axis, and the other support member being movably mounted on the other of said instrument members between a normal coaxial position relative to said one support member and an eccentric position relative to said one support member, the amount of said movement providing an enlarged radial gap greater than the free diameter of said loop, whereby said loop may be assembled within said gap at said eccentric position without distorting the same and is compressed between said rings at said normal position; a tool for assembling said loops within said gap comprising:

an elongated, rod-like element having a thickness substantially less than the normal radial gap between said rings,

a plurality of notches at one end of said element axially distributed along the surface thereof corresponding to the axial distribution of said rings for receiving a corresponding plurality of loops in hanging relation thereon and the other end including means for moving said element by an operator,

means for guiding said rod with said loops in place into said enlarged gap with said loops aligned with said rings, whereby with said other ring support member in its normal coaxial position relative to said one ring support member, said rod-like member may be freely withdrawn from said normal gap leaving said loops compressed between said rings.

4,141,140

APPARATUS FOR FEEDING AND PROCESSING BUTTONS

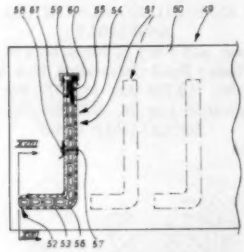
Bengt O. Petersson, Kungsbacka, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

Filed Mar. 17, 1977, Ser. No. 778,607

Claims priority, application Sweden, Sep. 13, 1976, 7610095; Sep. 16, 1976, 7610244

Int. Cl.[2] B23P *21/00*

U.S. Cl. 29—787 **2 Claims**



1. Apparatus for the feeding of buttons or similar objects to a processing station, comprising storing means for storing a number of the objects, said storing means having delivery means and means for pressing the objects toward said delivery means, and two holding elements located at the delivery means arranged to permit feeding of one of the objects from the storing means, catching the object which is fed, holding said fed object in the processing station, and releasing the fed object after the processing thereof, said holding elements each having the form of a section and mounted for rotation into three positions around an axis thereof, a first position being in which both the sections are placed in front of the delivery means at a distance from the delivery means permitting the feeding of one object from the storing means, a second position being in which the sections are placed in front of each other holding the object between the sections, and a third position being in which the sections are placed adjacent to the delivery means releasing the object which is then to be removed from the sections.

4,141,141

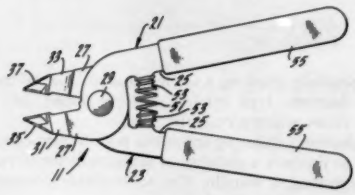
WIRE CUTTER

Clyde M. ViPond, Waterman, Ill., assignor to Ideal Industire, Inc., Sycamore, Ill.

Filed Sep. 23, 1977, Ser. No. 836,209

Int. Cl.[2] B26B *17/04*

U.S. Cl. 30—186 **3 Claims**



1. A hand operated cutter for cutting insulated wire of fine gauge, the wire being of the type having central cylindrical metal core surrounded by an annular layer of plastic insulation, the cutter including:

a pair of elongated members pivotally connected to each other intermediate their ends providing handles at one end for manual manipulation and cutting blades at the other end,

each cutting blade having a cutting edge facing the cutting edge of the other blade and movable into alignment with the other cutting edge upon closing action of the handles,

stop means located adjacent the cutting edges to prevent the cutting edges from contacting each other upon closing action of the handles,

the stop means providing a clearance between the cutting edges of the blades which permits the cutting edges to penetrate the wire core and to reduce the effective cross-section of the insulated wire at the areas of penetration to bring about autogenous separation of the insulated wire.

4,141,142

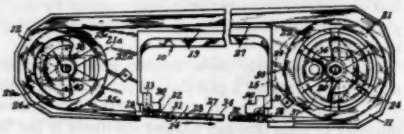
CARCASS SPLITTING BAND-SAW

Ralph Karubian, 7100 S. Avalon Blvd., Los Angeles, Calif. 90015

Filed May 16, 1977, Ser. No. 797,548

Int. Cl.[2] B27B *13/08*

U.S. Cl. 30—380 **11 Claims**



6. A band assembly having a drive pulley, an endless band-saw having a plurality of equally spaced holes and mounted around said drive pulley, and cleaning means adapted to engage the surface of said drive pulley, comprising:

(a) a plurality of retractable spring loaded pins mounted on said drive pulley, said spring loaded pins being normally

biased inwardly for engaging at least several of said plurality of equally spaced holes; and

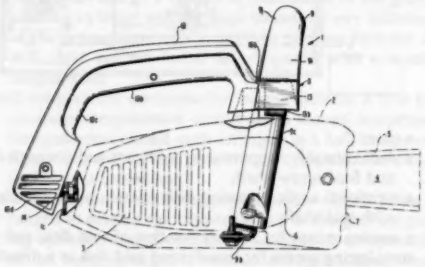
(b) projecting means mounted in close proximity to the inner surface of said drive pulley for projecting said pins outwardly during a portion of the rotational cycle of said drive pulley whereby said pins are urged into at least several of said plurality of equally spaced holes to thereby provide traction between said drive pulley and said bandsaw without interfering with the operation of said cleaning means.

4,141,143

CHAIN SAW HANDLE AND VIBRATION ISOLATION SYSTEM

Sidney Hirschkoff, Los Angeles, and Douglas A. Milliken, Thousand Oaks, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 26, 1977, Ser. No. 845,585
Int. Cl.[2] B27B *17/02*; F16F *1/36*
U.S. Cl. 30—381 **7 Claims**



6. In a chain saw comprising

a vibration generating assembly including

engine means,

guide bar means extending generally longitudinally from one side portion of said chain saw and having a longitudinal median plane,

cutter chain means mounted on the periphery of said guide bar means for movement thereabout, and

drive means operable to drivingly couple said engine means to said cutter chain means; and

a suspension system operable to support said vibration generating assembly and including

a handle assembly including

a front handle, and

a rear handle having a rear hand grip portion;

the improvement in said suspension system comprising:

U-shaped hand grip means extending transversely of said longitudinal median plane of said guide bar means and having a pair of horizontal leg portions and a generally upright connecting portion extending above said engine means,

one of said leg portions extending horizontally from a forward end of said rear handle, generally transversely of said longitudinal median plane of said guide bar means,

the other of said leg portions being spaced generally above said one leg portion and parallel thereto, and said generally upright connecting portion interconnecting said one and other parallel leg portions;

said U-shaped hand grip means

extending transversely across said longitudinal median plane of said guide bar means,

being located generally above said vibration generating assembly, and

defining a front hand grip portion disposed above and directly forward of said rear hand group portion; and

vibration isolating means interconnecting said U-shaped hand grip means and said vibration generating assembly.

4,141,144

DENTAL MATERIAL AND METHOD FOR CONTROLLING TOOTH LUSTRE

Stewart J. Lustgarten, 73 Dalton Rd., Holliston, Mass. 01746

Filed Jan. 26, 1977, Ser. No. 762,526
Int. Cl.[2] A61K *5/06*; C08K *3/34*
U.S. Cl. 32—15 **20 Claims**

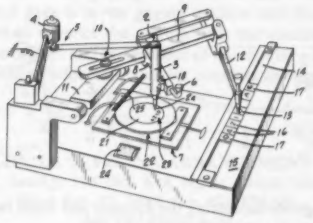
1. A dental material comprising in combination; a polymerizable resin binder wherein said binder is at least one acrylic monomer, an agent for polymerizing said binder, an inorganic filler and an additive for controlling the hue and lustre of said material, said additive comprising finely divided particles of translucent muscovite mica in a concentration of between about 1 to about 20% by weight of said material.

4,141,145

METHOD AND APPARATUS FOR PRODUCING EVIDENT PERMANENT SURFACE MARKINGS ON A GLAZED SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Fairfield, Conn.

Filed Aug. 29, 1977, Ser. No. 828,424
Int. Cl.[2] B43L *13/10*
U.S. Cl. 33—25 R **1 Claim**



1. Method for producing evident permanent surface markings on a glazed surface without scoring or preheating the surface comprising the steps of:

disposing, in one arm of a pantograph, a body of a metal selected from the group consisting of titanium and aluminum, said body having a comparatively sharply pointed end;

fixing the glazed surface to be marked beneath said pointed end and wetting the portion of the glazed surface to be marked with water;

rotating said body and bringing the rotating pointed end into contact with said wetted surface to a selected contact pressure; and

moving the other arm of said pantograph, through a pattern to be marked on said surface, at a selected rate to cause an evident amount of said metal to be transferred from said pointed end and bonded to said surface without scoring it.

4,141,146

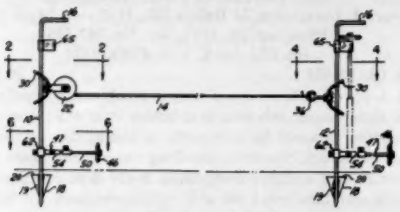
GARDEN ROW LOCATOR AND MARKER

D. Dwayne Broom, 7152 S. Seymour Rd., Swartz Creek, Mich. 48473

Filed Jul. 5, 1977, Ser. No. 812,451
Int. Cl.[2] E04G *21/18*; A01B *1/00*
U.S. Cl. 33—86 **6 Claims**

1. A row marker comprising a pair of stakes, a line held taut between the stakes, a reel from which the line is played, means for adjustably affixing said reel to one of said stakes, means for adjustably attaching the free end of said line to the other of said stakes, and a distance determining means adjustably attached to one of said stakes for locating a next row, wherein said distance determining means comprises a row-locating arm of

adjustable length hingedly secured at the base of said stake and said stake further comprises means to secure said row-locating



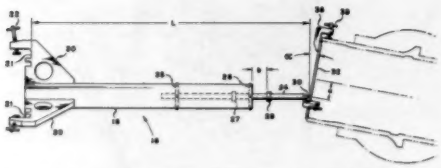
arm substantially parallel to said stake when said arm is not in use.

4,141,147

PUP MEASUREMENT GAUGE

George Klassen, North Delta, and Murray D. Feller, Richmond, both of Canada, assignors to Lockheed Petroleum Services, Ltd., New Westminster, Canada

Filed Dec. 21, 1977, Ser. No. 862,930
Int. Cl.[2] G01B 5/00, 5/24
U.S. Cl. 33—174 N **3 Claims**



1. A guage for measuring the distance and angle between the ends of two pipes comprising:

a first means and a second means,

said first means including means for rigidly attaching said means to an annular pipe and including a flat surface, located by such attaching means in a predetermined position with respect to said pipe,

said second means including an elongated tubular body having a first and second end,

said first end including means to rigidly attach said second means to the end of an annular pipe and position said tubular body in a predetermined orientation with respect to the axis of said pipe,

said second means including an extendable probe mounted in said tubular body for longitudinal movement with respect thereto for contacting the flat surface of said first means.

4,141,148

CONTOUR MEASURING APPARATUS

Hironori Noguchi, Tokyo, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 840,009
Claims priority, application Japan, Oct. 8, 1976, 51/135500[U]
Int. Cl.[2] G01B 7/28
U.S. Cl. 33—174 P **8 Claims**

1. A contour measuring apparatus of the type comprising a stylus for contacting the outer surface of the object to be measured, a support arm being mounted on a distal end thereof of said stylus, a slider movable in parallel with the longitudinal direction of sid support arm and oscillatingly movable and pivotally supporting said support arm about a horizontal axis perpendicularly intersecting the longitudinal direction of said support arm, a feed screw shaft threadably coupled to said slider so as to move said slider in parallel with the longitudinal direction of said support arm and a differential transformer provided between said support arm and said slier, said contour measuring device being characterized by:

a driven gear provided at one end of said screw shaft;

a first clutch;

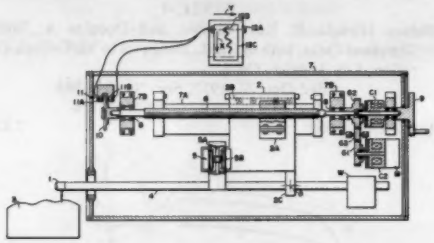
an idle gear meshing with said driven gear and coupled to said first clutch;

a motor couple to said first clutch;

a second clutch coaxially connected to said driven gear;

a manual handle connected to said second clutch; and

a rotational angle detecting device digitally detecting rotation of said screw shaft, said rotational angle detecting device comprises:



a case;

a shaft rotatably supported by said case and connected to said feed screw shaft;

a rotational angle detecting disk operationally associated with said shaft;

a sensing means for sensing rotation of said disk; and

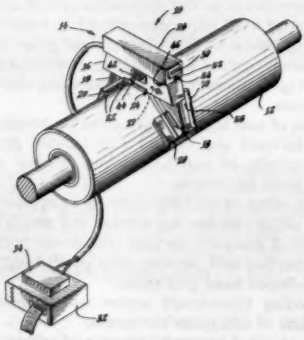
transferring means for transferring said disk in a direction of compensation for the backlash between said feed screw shaft and said slider when the rotation of said shaft is started.

4,141,149

PORTABLE COMPARATOR GAGE FOR MEASURING THE RELATIVE DEVIATION IN THE DIAMETER OF CYLINDERS

Harvey F. George, West Hempstead; Charles G. Marrara, Franklin Square, and Robert H. Oppenheimer, Glen Cove, all of N.Y., assignors to Gravure Research Institute, Inc., Port Washington, N.Y.

Filed Sep. 30, 1976, Ser. No. 728,196
Int. Cl.[2] G01B 7/12, 7/28, 7/34
U.S. Cl. 33—178 D **4 Claims**



1. A portable comparator gage for measuring the deviation in diameter of a gravure printing cylinder having a copper surface in which the pattern of cells in intaglio is to be formed, comprising:

a single rigid v-shaped support frame having planar support

surfaces for tangential contact with the surface of the gravure printing cylinder so that said rigid support frame is self-supporting when placed on a gravure printing cylinder, said rigid support frame being light in weight and having a stiffness to weight ratio above 50,000 to minimize spring open of the v-shaped support frame and prevent marring of the copper layer when placed on the gravure printing cylinder;

displacement means mounted in said rigid support frame including a depending movable plunger, said movable plunger being positioned along the longitudinal axis determined by the center of the gravure printing cylinder and the virtual apex of the included angle formed by the intersection of tangent lines through said planar support surfaces, said displacement means providing an output signal proportional to the relative movement of said plunger when said rigid support frame is placed on the gravure printing cylinder;

temperature compensation means for providing output signals for balancing out the errors in the displacement output signals due to a change in dimensions of the gravure printing cylinder and the gage caused by any differences in the temperature of the gravure printing cylinder and said rigid support frame as compared with a nominal temperature;

said temperature compensation means includes a first temperature compensation circuit and a second temperature compensation circuit each arranged in a half-bridge configuration, each of said temperature compensation circuits including a thermistor;

said thermistor of said first compensation circuit being arranged to contact the copper surface of the gravure printing cylinder, said thermistor of said second compensation circuit being arranged to contact said rigid support frame;

said first compensation circuit providing an output signal proportional to the change in dimensions of the gravure printing cylinder caused by temperature differential relative to the nominal temperature, said second compensation circuit providing an output signal proportional to the change in dimensions of the rigid support frame caused by a differential temperature relative to the nominal temperature; and

circuit means for receiving the output signals from said displacement means and said temperature compensation means for providing a signal proportional to the deviation in the diameter of the cylinder from a nominal diameter.

4,141,150

GAGE FOR MICROMACHINING SYSTEM

Donald M. Miller, Sunnyside, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 750,317, Dec. 14, 1976, Pat. No. 4,083,272. This application Dec. 14, 1977, Ser. No. 861,074

Int. Cl.[2] G01B 7/28

U.S. Cl. 33—174 P **2 Claims**

1. A tool gage for gaging the contour of a tool bit in the tool head of the micromachining tool to an accuracy of ±25 nanometers in X and Y directions, comprising:

an inclined triangular glass platen fixed to a support;

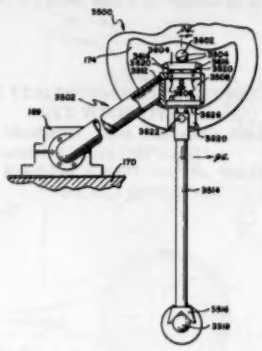
a pair of electrical contact pins embedded in the platen near its apex closest to the tool bit and projecting upwardly therefrom;

a metal gaging ball resting moveably on the platen and touching both electrical contact pins, thus completing an electrical circuit;

a plurality of set screws having threaded engagement with the support and bearing against a bottom surface of the platen to adjust the inclination of the platen and the force with which the gaging ball rests against the pins;

a gage arm fixed to the support at one end and to a linear and rotary bearing at the other end, the bearing being supported by pedestals anchored to the raised portion of the machine base, for moving the tool gage; and

a leg rotatably mounted at one end to the support and having at the other end a V-shaped fitting which rests on a reference bar when the tool gage is in a gaging position parallel



to the Z axis and attached to the machine base to position the center of the gaging ball on the Z axis wherein when the tool gage is in the gaging position and the tool bit is moved to contact the gaging ball, the electrical circuit will be broken and the contour of the tool bit gaged by the positions at which the tool bit contacts the gaging ball.

4,141,151

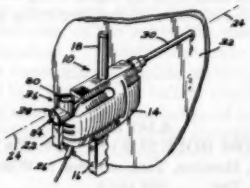
DRILL LEVELING ARRANGEMENT

Norbert E. Jansky, 108-20th Ave. N., St. Cloud, Minn. 56301

Filed Feb. 10, 1978, Ser. No. 876,622

Int. Cl.[2] G01C 9/28

U.S. Cl. 33—334 **3 Claims**



1. A leveling device comprising:

an elbow having hollow cylindrical members joined to each other at right angles, said cylindrical members having circular open ends defining mutually perpendicular planes;

a pair of resilient cylindrical plugs, one of said plugs being positioned within each of said cylindrical members, each of said plugs having a beveled end and a circular planar free end displaced from said open end of one of said cylindrical members, said beveled end of one of said plugs being in planar contact with said beveled end of the other of said plugs;

a pair or circular bubble levels, each of said levels having a base secured to said free end of one of said plugs and a curved upper portion the outermost part of which is substantially tangential with the plane defined by said open end of one of said cylindrical members, said bases of said levels defining mutually perpendicular planes, whereby to respectively indicate deviation from the horizontal of a first datum plane and a second datum plane, said datum planes being mutually perpendicular.

4,141,152

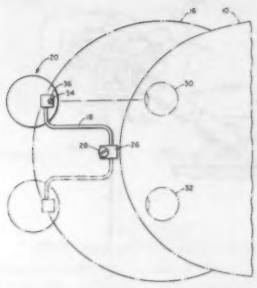
PILOTING INSTRUMENT

W. Gordon White, 8 Sterling Dr., Dover, Mass. 02030

Filed Nov. 30, 1977, Ser. No. 855,919

Int. Cl.[2] G01C *17/02*

U.S. Cl. 33—355 R **3 Claims**



1. A piloting instrument comprising a stiff visor, a liquid-filled magnetic compass, means for mounting said compass on said visor, comprising a clamp secured to said visor located substantially midway between the ends thereof, a clamp secured to said compass, each of said clamps having a bore extending inwardly from each side thereof, a bar having its end portions extending at angles and in different directions and terminating in balls, the ball on one end portion being secured to said clamp on said visor, the ball on the other end portion being secured to said clamp on said compass, said bar being capable of being inverted so that the balls on the end portions may be inserted in their respective clamps on either side of said bores so that the compass may be aligned with either the right or left eye, said liquid-filled magnetic compass including a compass card and a magnet secured to said card, the weight of the entire compass being about 1.2 ounces, the weight of the compass card and magnet in the liquid being about 1.8 grams and the half period of the compass card being about 1.5 seconds.

4,141,153

BOTTOM HOLE SURVEY APPARATUS

Paul M. Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed Aug. 3, 1977, Ser. No. 821,461

Int. Cl.[2] G01B *5/24*; E21B *47/022*

U.S. Cl. 33—286 **8 Claims**

1. A bottom hole survey apparatus comprising:

a survey instrument having a reference line therein;

an instrument barrel adapted to receive said instrument therein, said reference line being disposed in a predetermined angular location within said barrel;

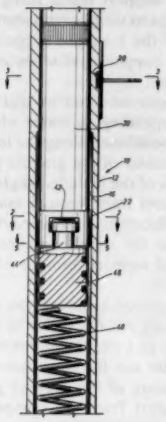
means disposed on the exterior of said barrel for receiving a visual sighting element thereon, said means being disposed in a predetermined relationship with respect to said reference line;

at least one spacer element connected to said barrel;

a mule shoe having a slot therein adapted to be connected to said spacer, said mule shoe being adaptable to receive a second visual sighting element within said slot thereof; and,

means for adjusting said mule shoe with respect to said spacer to dispose said slot in said mule shoe in a predetermined alignment with said reference line when said first and second visual sighting elements are visually aligned; and,

locking means disposed adjacent to said mule shoe and accessible from the exterior of the apparatus for locking



said mule shoe in position so as to maintain alignment between said slot and said reference line.

4,141,154

METHOD FOR THE COOLING OF A SHAFT FURNACE FOR THE CALCINING OF LIME, DOLOMITE OR MAGNESITE

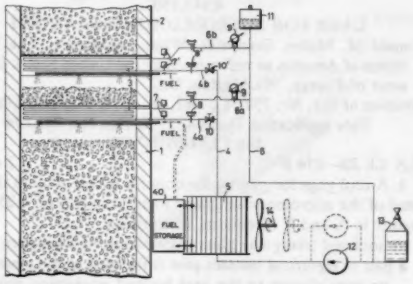
Heinrich Buchner, Bochum, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,148

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657238

Int. Cl.[2] F26B *7/00*; F27B *3/24*

U.S. Cl. 34—20 **19 Claims**



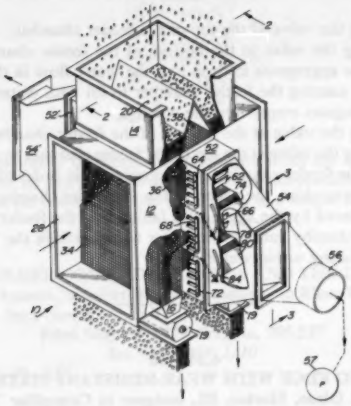
1. A method for the cooling of a lime shaft furnace for the calcining of limestone and which is operable with a combustible fuel, comprising the steps of: providing at least one shaft chamber in the shaft furnace; conveying the combustible fuel through a hollow beam means into the shaft chamber, said hollow beam means having a cooling means adjacent thereto in the shaft chamber; and conveying a temperature resistant cooling liquid in a closed circuit through the cooling means, said liquid having a boiling point of more than 100° C.

4,141,155

METHOD AND APPARATUS FOR DRYING AND COOLING PRODUCTS OF A GRANULAR NATURE

William Benzon, 613 Bittersweet Rd., Center Valley, Pa. 18034

Filed Dec. 16, 1976, Ser. No. 751,291
Int. Cl.[2] F26B *3/14*
U.S. Cl. 34—34 11 Claims



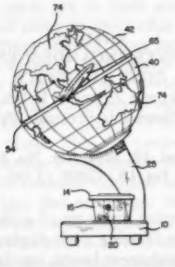
1. Apparatus for drying and cooling products comprising a housing having an inlet at the upper end of a downwardly extending flow passage defined by parallel screens, said housing having an outlet communicating with the lower end of said passage, said housing having an air inlet communicating directly with at least one of said screens, said housing having an air removal chamber on the opposite side of the flow passage from the air inlet, said air removal chamber being partitioned by partitioning members to form a plurality of discrete chambers, the combined vertical height of said discrete chambers being generally equal to the height of the air inlet, conduit means for removing air from said discrete chambers, said conduit means being discrete from and communicating with each chamber, and adjustable means for independently controlling flow between the conduit means and each of said chambers, said flow controlling means being disposed in said conduit means whereby the air flow through said discrete chambers may be regulated so that the greatest air flow is through the uppermost discrete chamber.

4,141,156

GLOBE LAMP WITH CIRCUMNAVIGATING AIRCRAFT

John H. Holtvoigt, Tipp City, Ohio, assignor to The Dolly Toy Company, Tipp City, Ohio

Filed Sep. 6, 1977, Ser. No. 830,434
Int. Cl.[2] G09B *27/08*
U.S. Cl. 35—46 A 17 Claims



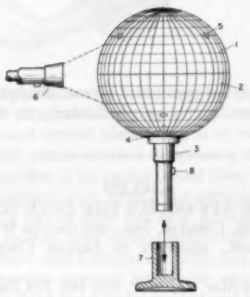
1. A decorative display device in the form of a globe comprising a base, a first hemisphere mounting on said base, a second hemisphere detachably mounted on said first hemisphere leaving an equatorial gap therebetween, a ring rotatably mounted on the inner circumference of said first hemisphere, an arm carried by said ring and extending radially outward through said gap, and a simulated aircraft carried by said arm and rotatable on a polar axis in an equatorial orbit around said device.

4,141,157

PORTABLE TEACHING DEVICE REPRESENTING THE SKY WITH THE STARS

Anthony A. Maldacker, 2696 Lakeshore Blvd. W., Apt. 24, Toronto, Ontario, Canada (M8V 1G8)

Filed Jun. 6, 1977, Ser. No. 804,058
Int. Cl.[2] G09B *27/06*
U.S. Cl. 35—47 12 Claims



1. A hollow sphere and a stem attached to it, the sphere made of transparent material comprising two halves, representing the Northern and Southern hemispheres of the sky, on the inner surface of the sphere is pasted some flexible, non-transparent sheet, like paper; on both sides of said sheet being shown celestial objects and related data of them, the inner side of said sphere being seen when looking through properly distributed peepholes on the sphere the diameter of which peepholes being about $\frac{1}{8}$", to enable the viewer to see a substantial part of the opposite inside surface of the sphere which can be illuminated by a flashlight the bulb of which protrudes into the sphere; the stem serving as the handle of the sphere and its lower part serving as the stand of the apparatus.

4,141,158

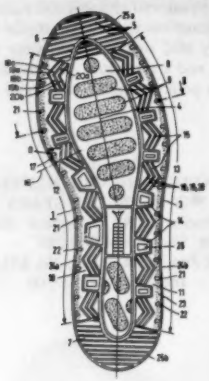
FOOTWEAR OUTER SOLE

Hans Benseler, Harkenbleck-Hannover, and Horst Schaefer, Bad Windsheim, both of Fed. Rep. of Germany, assignors to Firma PUMA-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,376
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613312
Int. Cl.[2] A43B *13/04;* A43C *15/00*
U.S. Cl. 36—32 R 67 Claims

1. A profiled outer sole for shoes made of a material having rubber-elastic properties, the sole including a tread surface, the tread surface comprises a front tread end portion and a rear tread end portion each having a predetermined profile, a middle area provided with a plurality of profiled projections arranged approximately symmetrically with respect to a longitudinal axis of the tread surface, and a profiled marginal area arranged on respective sides of the middle area, characterized in that the front tread end portion, the rear tread end portion and each of the middle and marginal areas include outer edges adjoining the tread surface to a shell rim of the outer sole, each of the outer edges is rounded with a predetermined radius, and

in that a plurality of groove-shaped slots are substantially uniformly distributed along outer edges of each of the marginal



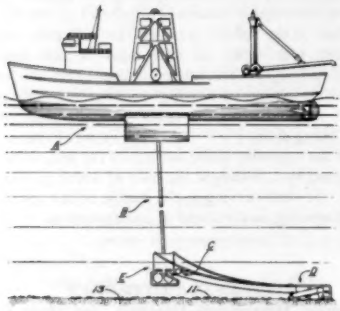
areas, each of said last-mentioned groove-shaped slots extending at least approximately perpendicularly to the respective outer edge.

4,141,159

METHOD AND APPARATUS FOR DEEP SEA MINING

Wilford V. Morris, Houston, Tex., and George W. Sheary, III, Redmond, Wash., assignors to Summa Corporation, Las Vegas, Nev.

Filed Mar. 18, 1977, Ser. No. 779,236
Int. Cl.[2] E02F *3/88, 7/02, 7/10*
U.S. Cl. 37—58 **15 Claims**



1. A method of harvesting mineral aggregates from an undersea floor and conveying them to the surface, comprising:

collecting the aggregates from the undersea floor with a submerged gathering apparatus and crushing them;

conveying the crushed aggregates to a submerged temporary storage bin located near the gathering apparatus;

placing a string of dual concentric pipes from the surface to the bin, the string having inner and outer pipes defining an annular passage and an inner passage selectively for downward flow and upward return flow;

pumping water from the surface down the passage selected for downward flow;

distributing, at the lower end of the string, a portion of the water flow to a conduit that extends under the bin and connects the downward flow passage with the upward return flow passage;

continuously releasing aggregates from the bin into the water flow in the conduit for transmission to the surface within the upward return flow passage;

the step of releasing aggregates into the water flow within the conduit further including;

providing a feeder chamber between the bin and the conduit with a valve at its top in communication with the bin and at its bottom in communication with the conduit;

opening the valve at the top of the feeder chamber to allow a portion of the aggregates to gravity fill the feeder chamber;

closing the valve at the top of the feeder chamber;

opening the valve at the bottom of the feeder chamber to allow aggregates to drop into the water flow in the conduit, causing the feeder chamber to fill with water as the aggregates empty into the conduit;

closing the valve at the bottom of the feeder chamber; and

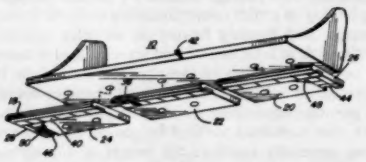
opening the valve at the top of the feeder chamber to gravity fill the feeder chamber with aggregates in order to repeat the procedure, the water within the feeder chamber being displaced by the aggregates falling into the feeder chamber, thereby causing the water to rise within the bin for displacing turbid water.

4,141,160

CUTTING EDGE WITH WEAR-RESISTANT MATERIAL

Harris S. Olson, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1977, Ser. No. 829,682
Int. Cl.[2] E02F *9/28;* B22D *23/08*
U.S. Cl. 37—141 R **8 Claims**



1. In a cutting edge assembly for an earthworking machine having a forwardly directed front cutting edge and at least one side edge extending rearwardly from the forward cutting edge, the assembly being in the form of a flat plate, the improvement comprising:

a front channel extending generally parallel to but inwardly spaced from the cutting edge;

a side channel extending generally parallel to but inwardly spaced from said side edge; and

individual rectangular wear-resistant blocks inlaid side by side within the front channel and the side channel so that an upper surface of the blocks is coincident with the surface of the flat plate.

4,141,161

REDUCED POWER INCANDESCENT BAR TYPE DISPLAY DEVICE

Benjamin E. Hiscock, and Zygmund Reich, both of Burlington, Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

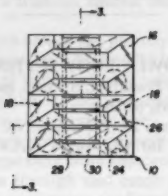
Filed Jul. 19, 1977, Ser. No. 817,064
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—547 **3 Claims**

1. A bar type display made up of a plurality of segments disposed side-by-side forming a bar display comprising:

a plurality of incandescent lamps, one lamp for each of the segments less one for illuminating all segments but one;

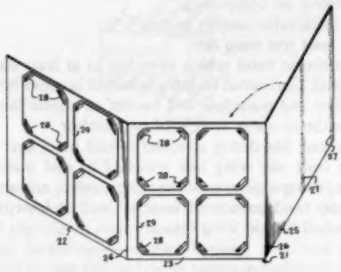
an elongated incandescent lamp utilized to enhance the

illumination of the plurality of segments and to illuminate the one segment not having an incandescent lamp;



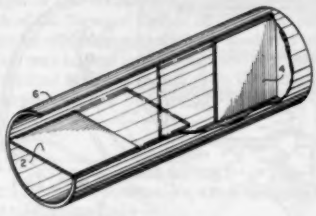
said plurality of lamps being separate from the elongated lamp so that said plurality can be lit independently; and means for connecting said bar display to a source of power.

4,141,162
HOLDER FOR PHOTOGRAPHS AND THE LIKE
Peter Mascolo, Brownsville, Tenn., assignor to Kleer-Vu Industries, Inc., New York, N.Y.
Filed May 10, 1977, Ser. No. 795,527
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—536 **1 Claim**



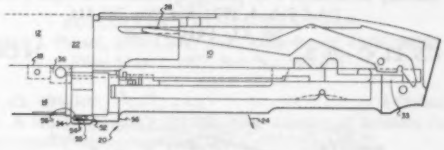
1. In a holder for photographs and the like, a member fabricated of heavy-duty stiff stock material and embodying a blank including a first and second section joined together by a fold line along one outer edge, said holder further including a third section integrally joined to an opposite edge of said second section by means of a fold line, a plurality of spaced apart areas of adhesive arranged on opposite sides of said third section in a predetermined manner contiguous to said first and second sections, each of said first and second sections having a plurality of preformed coacting corner slots, said slots receiving corners of photographs therein, said third section being interposed between said first and second sections, the adhesive on the third section being spaced away from the slots so that the sections are adhesively joined together away from the slots, said third section providing a backing for the first and second sections when the parts are in their assembled position, a hinged joint arranged along an inner edge of said holder, said hinged joint embodying flexible tapes having a sticky inner surface engaging an adjacent inner edge portion of the holder, a strip held between projecting outer portions of the tape, said strip being provided with a plurality of apertures therein, said holder adapted to hold photographs of the instant developed type without using plastic films for protection of the photographs, said slots having a trapezoidal shape, and said slots being provided with rounded corners, said slots being provided with inner edges that are longer than the outer edges thereof, said slots further including side edge portions that are arranged angularly with respect to said inner and outer edges of the slots, certain of the side edge portions of said slots being arranged in alignment with respect to each other, the distance between the inner and outer edges of the slots being less than the length of the side edge portions of the slots, said blank being imperforate except for said slots.

4,141,163
SIGHTING DEVICE FOR FIREARMS
Harry R. Rubin, 80 York Ter., Brookline, Mass. 02146
Filed Jul. 29, 1977, Ser. No. 820,201
Int. Cl.[2] F41G *1/04, 1/42*
U.S. Cl. 42—1 S **5 Claims**



1. Firearm sighting device comprising a first planar member fixed in a first plane, and a second planar member fixed in a second plane, said second plane being at an angle to said first plane, each said planar member intersecting the plane of the other planar member at the center of said other planar member, said planar members each having flat elongated surfaces extending along a line of sight and each having a leading edge surface and a trailing edge surface interconnected by said flat elongated surfaces, and a tubular member, said planar members being in said tubular member, lengthwise edges of said planar members being fixed to an inside wall of said tubular member, said first planar member being proximate a first end of said tubular member and removed from a second end of said tubular member, said second planar member being proximate said second end of said tubular member and removed from said first end of said tubular member, said trailing edge surface of said first planar member being opposed and proximate to said leading edge surface of said second planar member.

4,141,164
MAGAZINE ISOLATOR FOR PUMP SHOTGUNS
Robert L. Hillberg, Chesire, Conn., assignor to Browning Arms Company, Morgan, Utah
Filed Jan. 18, 1978, Ser. No. 870,428
Int. Cl.[2] F41C *13/00*
U.S. Cl. 42—17 **6 Claims**



1. A magazine isolator for a shotgun having a pump action operable sequentially from a battery position through an eject position to eject a cartridge from the firing chamber, through a load sequence in which cartridge are released from the mouth of a tubular magazine sequentially one and back to said battery position in which the cartridge is rammed into said firing chamber, said isolator comprising:

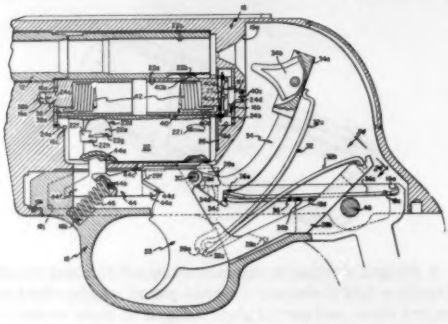
a selector mounted proximate said pump action and operable between a repeat position and a single position; and

disable means structurally associated with said pump action and said selector to selectively mechanically inhibit said pump action from operating past said eject position when said selector is in said single position.

4,141,165
DOUBLE ACTION REVOLVER APPARATUS AND METHOD

Wilhelm Dichter, Vernon, Conn.; Henry J. Tatro, Westfield, Mass., and C. Edward Warner, West Simsbury, Conn., assignors to Colt Industries Operating Corp., Hartford, Conn.

Filed Jul. 26, 1977, Ser. No. 819,127
Int. Cl.[2] F41C *1/00, 19/00*
U.S. Cl. 42—65 16 Claims



1. In a firearm of the type having: a frame; a hammer mounted on the frame for movement between normal and fired positions; a trigger mounted on the frame for movement between normal and pulled positions; and a main spring interposed between the hammer and the trigger for driving the hammer to the fired position, the main spring being adapted to be compressed by moving the trigger from the normal position thereof toward the pulled position thereof without substantial hammer movement from the normal position thereof, the improvement comprising:

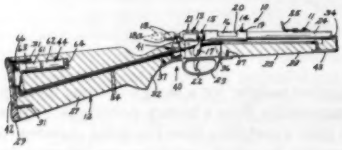
a toggle spring device interposed between the hammer and the frame for resisting substantial hammer movement from the normal position thereof while the main spring is being compressed and for urging return movement of the hammer from the fired position thereof to the normal position thereof; and

means responsive to movement of the trigger for contacting and buckling the toggle spring device to change the resistance thereof such that the compressed main spring may drive the hammer to the fired position thereof.

4,141,166
GUN SAFETY DEVICE

Timothy R. Schultz, P.O. Box 466, Madison, S. Dak. 57042

Filed Feb. 3, 1977, Ser. No. 765,411
Int. Cl.[2] F41C *17/08*
U.S. Cl. 42—70 B 14 Claims

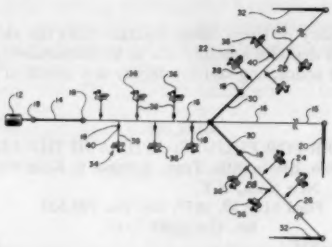


1. In a shoulder held firearm including a barrel portion and a stock portion, said barrel portion including at least one barrel, firing action and trigger assembly, said stock portion including a butt portion and a forearm portion, said forearm portion having a foregrip, the improvement comprising: safety means including shoulder sensing means and hand sensing means, said shoulder sensing means being disposed at said butt portion, said hand sensing means being disposed at said foregrip, said safety means further including blocking means coupled to said shoulder and hand sensing means, said blocking means preventing firing of said firearm except when said shoulder sensing means is actuated by shoulder contact and said hand sensing means is actuated by hand contact.

4,141,167
WATERFOWL DECOY SETTING MEANS

Lawrence L. Muehl, Frankfort, S. Dak., assignor to Dakota Cat Eye Inc., Frankfort, S. Dak.

Filed Jun. 28, 1976, Ser. No. 700,142
Int. Cl.[2] A01M *31/06*
U.S. Cl. 43—2 7 Claims



1. A decoy set comprising:

(A) a retrievable casting anchor;

(B) at least one main line;

(C) an elastic band which stretches to at least six times its normal, contracted length connected in series between the anchor and main line and having an elastic limit greater than the in-water weight of said anchor;

(D) at least one decoy attached to said main line; and,

(E) at least one wing line attached to said main line and comprising a permanent anchor, a cable, and an auxiliary elastic band connected in series and at least one decoy attached to said wing line.

4,141,168
FISH CATCHER

Chikao Nishi, 6-12, 3-chome, Kaorigaoka, Sakai-shi, Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,536
Claims priority, application Japan, Nov. 22, 1976, 51-141021
Int. Cl.[2] A01E *97/12*
U.S. Cl. 43—15 8 Claims

1. A fish catcher to be suspended from a fishing line, said fish catcher comprising:

a. an elongated member, said fishing line being connectable to the center of said elongated member, the leg portions of said member on either side of said center being resiliently bendable into a loop closed by means of a hook-and-ring mechanism including a hook and a hook ring firmly en-

gageably retained with each other by the resilient restoring force of said bendable member;

b. one of said hook and said hook ring being unitary with one leg portion at a location spaced from the terminal end thereof;

c. said terminal end of said leg portion being formed into a catch ring of diameter substantially larger than said hook ring, the plane of said catch ring being generally perpendicular to the plane of said loop and positioned beneath the hook-and-ring mechanism; and

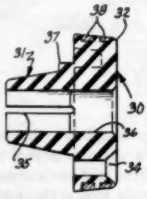
d. a hook line being operatively connectable to the elongated member and depending from adjacent the hook and hook ring mechanism through said catch ring, said hook and hook ring mechanism being configured for disengagement by downward pulling force on said hook line.

4,141,169

DEEP TROLLING APPARATUS

James E. Rieth, 2315 Okemos Dr., SE., Grand Rapids, Mich. 49506

Filed Jan. 13, 1977, Ser. No. 759,239
Int. Cl.[2] A01K *89/00*
U.S. Cl. 43—27.4 **15 Claims**



1. In a trolling apparatus including a trolling reel rotatably mounted to support means, and drive means for the reel, an improved slip clutch comprising:

said reel including a tapered bushing receiving aperture formed therein and said drive means including an axle; and

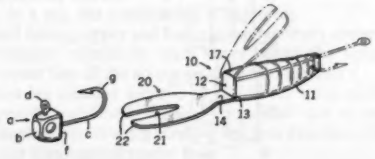
a single compressive bushing having an exterior surface tapered to mate with said tapered aperture of said reel, said bushing secured within said reel for rotation therewith and including a centrally extending cylindrical aperture defining a frictional bearing surface against said axle, said axle extending through said cylindrical aperture of said bushing, and wherein said bushing is axially adjustable with respect to said reel for providing a predetermined selectable drag for said reel when said axle is held stationary.

4,141,170

ARTIFICIAL FISHING LURES AND PROCESS FOR MOLDING SAME

Donald H. Fosher, 212 S. Bemiston, St. Louis, Mo. 63105

Filed Jun. 29, 1977, Ser. No. 810,964
Int. Cl.[2] A01K *85/08*
U.S. Cl. 43—42.24 **3 Claims**



1. For use with a jig head having an aft surface through which projects the shank of an upwardly and forwardly curving hook,

a fishing lure molded integrally of resilient material and comprising

a body portion and

a wing portion,

characterized in having a transition flap portion connecting said body and wing portions, said transition flap portion extending from the lower edge of the forward surface of said body portion,

the length of said transition flap portion being equal to the depth of the forward surface of said body portion,

whereby on assembly with such jig head said transition flap portion may be bent upward adjacent said forward surface and secured between the aft surface of said jig head and the forward surface of said body portion.

4,141,171

FISH LURE

Robert C. Muddiman, Middletown, Ohio, assignor to Waller B. Hunt, Middletown, Ohio

Filed Mar. 25, 1977, Ser. No. 781,508
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.47 **14 Claims**

1. A fish lure comprising a body, a wing lip, and means for having a fish hook secured to said lure, said body having a bottom side, a top side, a tail end, and a blunt-shape head end having a substantially flat vertically extending face, said wing lip being cantilevered forwardly and upwardly from the forward end of said bottom side of said body, said lure further comprising means for causing said lure to normally float when disposed in a body of water so that said bottom side faces downwardly and so that at least substantial portions of said body and said wing lip are disposed below the surface of said body of water, and means for attaching a fish line rig to said lure so that said wing lip will resolve a substantial portion of a generally forwardly acting force which is suddenly imposed on said lure via said fish line rig into an upwardly acting force impulse whereby said lure can be caused to jump from said water in response to suddenly applying a sufficiently great said generally forwardly acting force on said fish line rig.

4,141,172

AUTOMATIC CRUSTACEAN TRAP

Mikhail I. Prosol, 2546 Cedar Ave., Long Beach, Calif. 90806

Filed May 2, 1977, Ser. No. 793,071
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **3 Claims**

1. A trapping device for effecting capture of lobsters or other crustaceans, comprising:

a substantially planar base member;

a tubular mount extending orthogonally from one surface of said base member;

a spring-loaded latch disposed on the interior of said mount including a bait supporting lever extending to the exterior thereof;

a tubular guide received in attachment in the free end of said mount and extending axially therefrom, said guide further including two diametrically opposed longitudinal slots formed in the lateral surface thereof;

a latching rod received for sliding articulation within said guide, said rod extending beyond said guide on either end thereof, said rod further including a latch engaging lip on the lower end thereof receivable within said mount for engaging said latch the engagement therebetween being

released by a downward articulation of said bait supporting lever;

a collar conformed to surround said guide and connected to said rod through said longitudinal slots for concurrent translation therewith;

a first and second peripheral frame member each generally conformed to approximate one half of the periphery of said base, each said frame member forming a loop like

structure pivotally engaged to said base at the free ends thereof, said frame members being connected to springs for pivotal urging thereof away from said base;

a flexible mesh connected between said frame members and said base; and

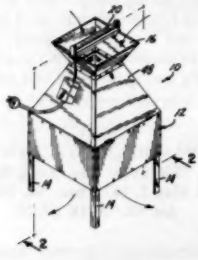
a first and second connecting element disposed respectively between said first and second frame member and said collar.

4,141,173

FLY CATCHER

Joseph F. Weimert, Hiawatha Park, Rice Lake, Wis. 54868, and Julius E. Haes, Jr., Rte. 1, Box 166, Roca, Nebr. 68430

Filed May 20, 1977, Ser. No. 799,101
Int. Cl.[2] A01M *1/04, 1/06*
U.S. Cl. 43—113 **6 Claims**



1. A device for capturing and exterminating flies, which comprises:

(a) a housing including an upper, flared, portion defining an inlet and constricted throat, and a lower portion defining a collection bag cavity above a fan enclosure, said housing having an exhaust outlet at its lower end;

(b) a disposable collection bag releasably mounted within said bag-enclosing cavity, said bag extending downwardly from the throat;

(c) an exhaust fan mounted within said fan enclosure, said fan being adapted to draw a steady stream of air downwardly through said inlet, throat and collection bag at a rate of approximately 2,400 cubic feet per minute to exterminate bugs captured in the collection bag by dehydration; and

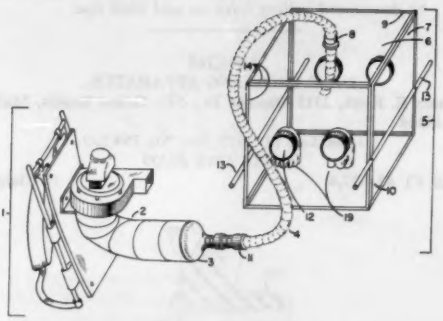
(d) means, including heating means, mounted above said inlet for attracting flies to the vicinity of the inlet.

4,141,174

QUANTITATIVE APPARATUS FOR SAMPLING ATHROPODS ASSOCIATED WITH FIELD CROPS

James W. Smith, Leland, Mich., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,273
Int. Cl.[2] A01M *1/06*
U.S. Cl. 43—139 **1 Claim**



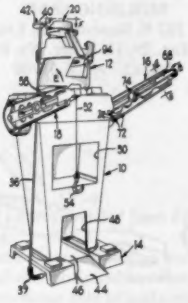
1. In an apparatus for sampling arthropods in an agricultural environment wherein a vacuum device is employed to withdraw said arthropods from said environment through a hose on said device, and wherein said arthropods are captured in a filter bag on said device, the improvement comprising a rectangular, transparent, portable, arthropod-entrapment cage connected to said hose, wherein said hose extends into said cage a sufficient distance to reach all points on said cage's inner sides, top and bottom, and wherein said cage is bottomless to permit it to be placed over and completely around a plant specimen in said environment, and said cage's sides include openings for insertion of human hands and arms, said openings also including elastic sleeves to form a seal-tight enclosure around said arms, and to form a covering over said openings during nonuse of said openings.

4,141,175

ACTION TOY

Gordon A. Barlow, and Palmer J. Schoenfield, both of Evanston, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,394
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—103 **7 Claims**



1. An action toy in the form of a robot, comprising:

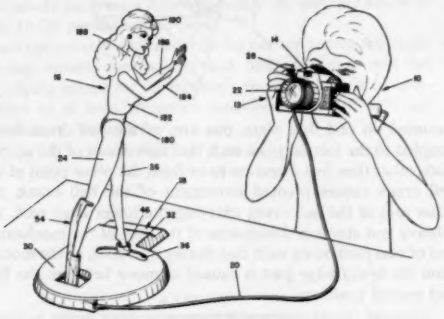
a body portion;
a head portion mounted on top of said body portion;
a base at the bottom of said body portion;
drive means on the base portion for moving the toy robot over a support surface;
a pair of limbs mounted on the body portion and protruding outwardly therefrom;
an outwardly opening compartment in said body portion;
a crane-type mechanism mounted on one of said limbs for grasping and lifting accessory items for manually moving the items into said compartment; and
a projector on the other of said limbs for manually launching accessory items therefrom.

4,141,176

POSABLE DOLL, MEANS FOR MOVABLY MOUNTING SAME AND TOY CAMERA

Alcwyn Flicker, Carson; Derek J. Gay, Rancho Palos Verdes; Tony Rhodes, Torrance, and Roger H. Sweet, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 12, 1977, Ser. No. 832,456
Int. Cl.[2] A63H *13/04*
U.S. Cl. 46—116 **18 Claims**



1. In a toy, the combination comprising:
a doll having a torso with a pair of leg members connected thereto, at least one of said leg members being movable with respect to the other, said torso having at least one other portion attached thereto in relatively movable relation ;
means within said doll for moving said one other movable portion in response to relative movement of said at least one leg member;
a base having means for supporting the leg members of said doll with said doll in a generally upright position;
means within said base coupled to said leg member supporting means for moving said leg member support means and thus providing relative movement between said leg members;
a camera having manually-operable means; and
means interconnecting said manually-operable means and said base for actuating said means within said base for moving said at least one other portion of said doll in response to actuation of said manually-operable means whereby to simulate the posing of the doll for the photographing thereof.

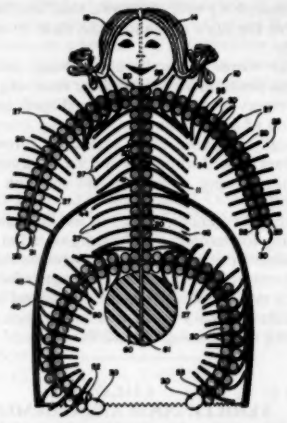
14. In a toy, the combination comprising:
a doll having upper and lower torso members connected for rotation relative to each other about the longitudinal center line of the so-connected torso members;
a first leg member secured to said lower torso member for pivotal movement about a side-to-side axis to angularly displace said first leg member in a first direction relative to said longitudinal center line;
a second leg member coupled to said lower torso member about a fore-to-aft axis for angularly displacing said second leg member relative to said longitudinal center line in a second direction generally perpendicular to said first direction;
a head supporting member rotatably mounted in said upper torso member;
means within said torso members for rotating said head supporting member in response to pivotal movement of said first leg member;
a base member having means for receiving portions of said leg members for supporting said doll in a generally upright position; and
means within said base member for providing, through movement of said leg receiving means, relative displacement between said leg members in said first direction and in said second direction for tilting the longitudinal center line of the torso members relative to said second leg member and for rotating said head supporting member in response to pivotal movement of said first leg member.

4,141,177

REVERSIBLE, CREATIVE DOLLS AND METHOD OF ASSEMBLING SAME

Lisa A. Vu, 1469 Henry Ave., Des Plaines, Ill. 60016

Filed May 11, 1977, Ser. No. 795,865
Int. Cl.[2] A63H *3/02*
U.S. Cl. 46—151 **21 Claims**

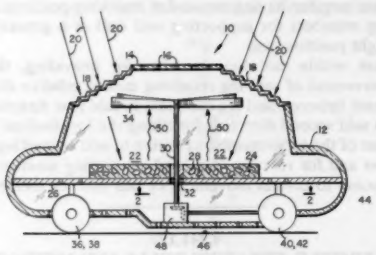


1. A method of assembling a doll, comprising the steps of passing a first bi-ended stiffened chenille into a first head member, affixing a second stiffened chenille to the first chenille at a point on the first chenille below the first head member and substantially at the second chenille midpoint to provide a cruciform chenille array, alternately installing inflexible spacer members and small flexible disk members upon the second chenille so as to form first doll arms, installing at least one gown member on the first chenille so as to cover at least portions of subsequently formed doll arms and a subsequently installed doll head member, alternately installing inflexible spacer members and flexible disk members upon the first chenille only between the second chenille and a first chenille midpoint so as to form a first doll thorax, installing a gown skirt member substantially at the first chenille midpoint below the first thorax, and thereafter alternately installing inflexible spacer members and flexible disk members upon the first chenille so as to form a second doll thorax, affixing a third stiffened chenille to the first chenille at a point on the first chenille member below the first doll arms and substantially at the third chenille midpoint, alternately installing inflexible spacer members and small flexible disk members upon the third chenille so as to form second doll arms, and passing the second end of the first chenille into a second head member so as to provide a second doll head thereby forming a reversible doll having two exposable thorax portions.

4,141,178
SOLAR OPERATED TOY APPARATUS

Betty McGraw, 1619 Debeney Dr., Houston, Tex. 77039

Filed Jul. 25, 1977, Ser. No. 818,954
Int. Cl.[2] A63H 29/00
U.S. Cl. 46—201 6 Claims



1. A solar operated toy apparatus comprising, in combination:

a housing having the top portion thereof provided with a plurality of random apertures centrally disposed therein, said housing being provided with a circularly shaped lens circumscribing said apertures, said lens being formed to receive the sun's rays and focus them to an area therebeneath;

reservoir means having heat retaining material disposed therein positioned in said area for receiving said sun's rays, said reservoir being toroidally shaped and affixed to a portion of said housing;

a vertically disposed shaft extending through the center aperture of said toroidally shaped reservoir means;

vane means being affixed to said shaft on the upper end thereof;

wheel means rotatably affixed to the bottom portion of said housing for moving said housing on a flat surface;

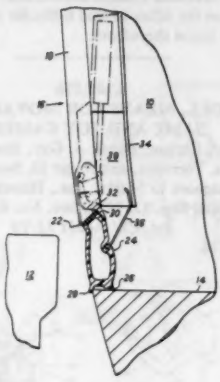
gear means operatively coupled between the lower end of said vertical shaft and said wheel means for connecting the rotary motion of said vane means caused by rising hot air currents to rotary motion of said wheel means, thereby moving said housing on said flat surface.

4,141,179
VEHICLE DOOR ARRANGEMENTS

John C. Newson; Geoffrey R. Tregoning, and James B. Digby, all of London, England, assignors to Westinghouse Brake & Signal Co., Ltd., Chippenham, England

Continuation of Ser. No. 745,863, Nov. 29, 1976, abandoned, which is a division of Ser. No. 553,005, Feb. 25, 1975, abandoned.
This application Dec. 19, 1977, Ser. No. 861,665
Claims priority, application United Kingdom, Sep. 27, 1974, 41994/74; Dec. 12, 1974, 53843/74; Mar. 21, 1974, 12758/74
Int. Cl.[2] E06B 7/28
U.S. Cl. 49—316 8 Claims

1. A vehicle door arrangement comprising an upper main part and a lower edge part for closing a gap between the upper main part of the door and a doorway occupied by the door when in a closed position, and moving means operable to retract said lower edge part upwards into the door prior to opening of the door from the closed position thereof and for extending the lower edge part downwards to close the gap upon reaching said closed position, said moving means comprising a coupling mechanism coupling the lower edge part and the door, the mechanism being operable to change the position of the lower edge part from a first position in which the gap is closed to a second position in which the lower edge part is retracted from the gap, and vice versa, said coupling mechanism comprising first and second plates linked by first and second link members each pivotally attached both to the first and second plates at respective fulcra, two points on the first plate being constrained to follow a path which is principally straight and has a sharp 120° curve at a location in which the coupling mechanism causes the lower edge part to close or seal the gap, the radius of said curve being small relative to the length of the straight part of said path, at least one of said two points being non-coincident with the fulcra on said first plate, one point on the second plate being constrained to follow the principally straight part of said path, said one point on the second plate being substantially coincident with the respective fulcrum of the first link member, and a bellcrank pivotally

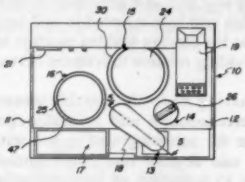


mounted on said first plate, one arm of the bell crank being coupled to the second plate such that movement of the second plate other than in a direction to or from the pivot point of the bell crank causes pivoted movement of the bell crank, the other arm of the bell crank carrying the lower edge part, the relative and absolute dimensions of the part of the mechanism and of said path being such that during operation of the mechanism the lower edge part is caused to move between the first and second positions.

4,141,180
POLISHING APPARATUS

Gerald L. Gill, Jr., Scottsdale, and Philip J. Rioux, Glendale, both of Ariz., assignors to Kayex Corporation, Rochester, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,295
Int. Cl.[2] B24B 7/00
U.S. Cl. 51—5 R 5 Claims



1. Apparatus for polishing one surface of a thin, flat wafer of a semi-conductive material, comprising:

a plurality of stations arranged in angularly spaced and circular relation to a common axis, including a wafer supply station, a cleanup station having a rotatable brush, a primary polishing station having a rotatable polishing surface, a secondary polishing station having a rotatable polishing surface, and a polished wafer receiving station;

drive means interconnected to the primary polishing and secondary polishing stations for rotating the polishing surface in the respective stations;

carrier means pivotally mounted with respect to the com-

mon axis and movable in an arcuate path over each of the stations and in a vertical direction when positioned in a predetermined relation to one or more of the stations, the carrier means including a pressure head at the free end thereof for engaging the other surface of the wafer for supporting and holding the same, first drive means for continuously rotating the head, and second drive means for moving the carrier means through the arcuate path;

means operatively connected to the carrier means for oscillating the pressure head in a small arcuate path when the pressure head is in the primary polishing station and while the pressure head is being rotated;

means operatively connected to the carrier means for moving and holding the same in a vertically raised position during movement of the carrier means from one station to another and for maintaining the carrier means in a vertically lowered position in each respective station for picking up a wafer, for holding a wafer with a predetermined pressure in contact with an area between the rotational axis and the periphery of each polishing surface, for ejecting the wafer in the receiving station and for scrubbing the pressure head in the cleaning station;

means operatively connected to the carrier means for successively applying a flow of liquid, a vacuum and a flow of air to the pressure head; and

means operatively connected to the carrier means, the oscillating means, the moving and holding means and the applying means for controlling a sequential cycle of operation to at least transport, position and polish the one surface of the wafer.

4,141,181

HOLDING DISK FOR A BORELESS GRINDING WHEEL

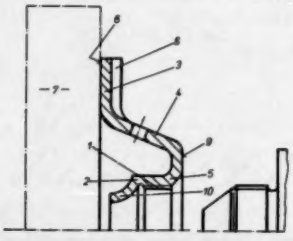
Hermann Munnich, Bad Kissingen, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,694

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 7608858[U]

Int. Cl.[2] B24B *41/00*

U.S. Cl. 51—168 **15 Claims**



1. A sheet metal holding disk adapted for attachment to a boreless grinding wheel, having in the center, a sleeve-shaped section provided with a thread adapted to be coupled to a drive means and, at the outer periphery, an annular flange adapted for attachment to said boreless grinding wheel, said flange extending in the radial direction in a transverse plane displaced axially toward the position of said grinding wheel in relation to all portions of said sleeve-shaped section, and a connection section joining an end of said annular flange to the end of said sleeve-shaped shoulder most remote from said plane.

4,141,182

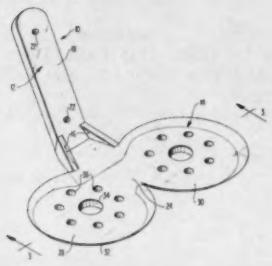
CORROSION PROOF SNOW GUARD

John R. McMullen, 1500 State St., Camp Hill, Pa. 17011

Filed Feb. 2, 1978, Ser. No. 874,597

Int. Cl.[2] E04D *13/00*

U.S. Cl. 52—24 **3 Claims**



1. In a roof snow guard of the type comprising a base member for mounting flush with an inclined building roof and extending parallel thereto in the direction of incline and having a wing member fixed to the lower end thereof relative to the inclination of the roof and extending angularly outwardly therefrom away from the base member and acting to prevent movement of snow or ice piling up on the roof behind the wing member, the improvement wherein: said base member and said wing member comprise an integrally molded clear plastic element to render the snow guard practically invisible on the roof and to prevent discoloration of the roof during weathering of the snow guard.

4,141,183

PRESTRESSED HOLLOW CHAMBER COMPOSITE STRUCTURAL ELEMENT CAPABLE OF SUPPORTING HEAVY LOADS

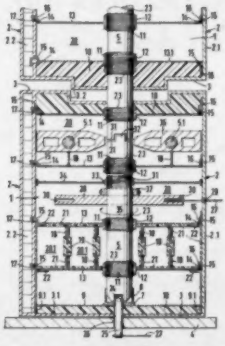
Otto A. Becker, Robert-Koch-Strasse 59, D-6600 Saarbrucken 6, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,574

Claims priority, application Austria, Dec. 30, 1976, 9826/76; Switzerland, Dec. 31, 1976, 16501/76; Fed. Rep. of Germany, Apr. 2, 1977, 2714920

Int. Cl.[2] E04B *2/14, 1/40, 1/90*

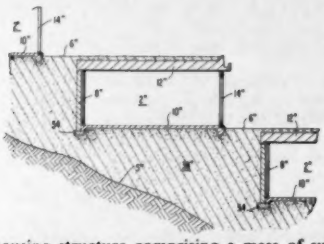
U.S. Cl. 52—127 **49 Claims**



1. A hollow-chamber composite structural element capable of carrying high load and being prestressed in the direction of its length and against the direction of loading, comprising two outer structural shells connected with each other in frame-like manner along their edges and having supporting elements arranged between them; at least one stressing spindle which is turnable around its axis arranged within and supported against the structural element parallel to said outer structural shells

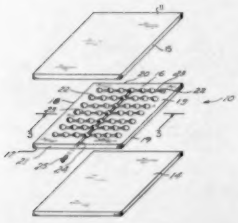
and coinciding with the intended main direction of loading of the structural element, said spindle bearing axially spaced threaded sleeves which are fastened in non-rotating manner in the structural element and have flange-like transverse supports, said transverse supports in turn being operatively connected at their free edges with said outer structural shells, stressing said shells in tension in direction parallel to said stressing spindle.

4,141,184
TERRACED DWELLINGS
Henri C. Vidal, Tour Horizon 52, quai Nationale, 92806 Puteaux, France
Filed Aug. 9, 1977, Ser. No. 823,164
Int. Cl.[2] E02D *21/01*
U.S. Cl. 52—169.4 **20 Claims**



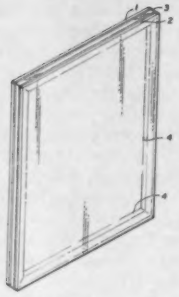
1. A housing structure comprising a mass of substantially particulate material superimposed on the surface of the earth, said material being arranged to provide terrace levels each having a front edge portion and a rear edge portion, a plurality of dwellings being arranged separately on said terrace levels, said dwelling on one of said levels including a retaining wall extending along said rear edge portion and including a roof resting directly on and supported by said wall, the dwelling of the next higher terrace level including a floor and a front wall, said floor being spaced above the roof of the dwelling on the next lower level and said front wall being spaced rearwardly of said rear wall of said next lower level, said particulate material substantially filling the space between said roof and said floor of the next higher level, and said rear wall being positioned to retain said material.

4,141,185
SOLAR COLLECTOR COVER
Elvin W. Keith, 1115 E. 31st, Kearney, Nebr. 68847
Filed May 18, 1977, Ser. No. 797,979
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—171 **6 Claims**



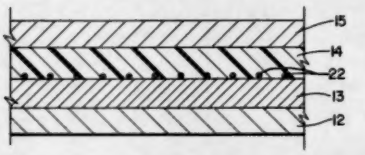
1. A removable solar collector cover for placement between a source of radiant energy and a solar collecting unit, the solar collector cover adapted to be placed on top of said solar collecting unit, as a thermal barrier, and between said source of radiant energy, said cover comprising a core unit having a center block, a plug unit, and a plurality of sealed substantially evacuated cavities formed therein, said cavities include a plurality of holes formed in said center block, and at least one groove in said core unit fluidly interconnecting said holes, and said plug unit is secured in said groove to seal said holes and said groove from the atmosphere, said core unit operable to transfer solar radiation therethrough from the source of radiant energy to the solar collector unit.

4,141,186
ADSORBENT FOR USE IN DOUBLE GLAZED WINDOWS
Richard J. Schoofs, 1605 School St., Moraga, Calif. 94556
Division of Ser. No. 603,267, Aug. 11, 1975. This application May 27, 1976, Ser. No. 690,417
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—172 **6 Claims**



1. In a double glazed window having two parallel panes of glass spaced apart to leave a rectangular parallelepiped air space between the panes, having the peripheries of the two panes sealed to enclose said air space and having an adsorbent disposed along all or part of the interior periphery of the enclosed air space, the improvement which comprises employing as the adsorbent a molecular sieve zeolite having pore apertures which permit entry of water vapor into the pore space and exclude oxygen and nitrogen from the pore space, whereby pressure changes in said enclosed air space resulting from adsorption and desorption of oxygen and nitrogen as the temperature of said enclosed air space varies are substantially eliminated.

4,141,187
ROOFING AND SURFACING MATERIAL AND METHOD
Robert J. Graves, 6319 Lee Hwy., Arlington, Va. 22205
Filed Jan. 28, 1977, Ser. No. 763,733
Int. Cl.[2] H05B *3/34*
U.S. Cl. 52—173 R **6 Claims**



1. A water-impermeable, weather resistant, light-weight structural surface for use in static structures, consisting of:
   a. a structural base surface comprising a supported material selected from the group consisting of wood, metal, and concrete;
   b. a layer of water-impermeable epoxy adhesive utilizing a water-activable curing agent, having a thickness of from about one-eighth to one-half inches disposed adjacent to said base surface and being directly adhered thereto, said

adhesive layer having been applied in a flowable condition whereby a generally smooth top surface of the adhesive layer is produced;

c. a light-weight electrical heating grid incorporated into said water-impermeable layer; and

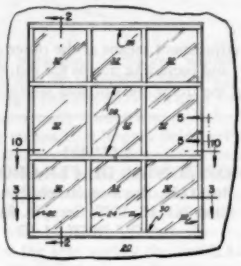
d. an upper layer of indoor-outdoor carpeting adhered to the top surface of said water-impermeable adhesive layer, said upper layer comprising a low-nap, non-woven, relatively thick web of polyolefin polymer or copolymer fibers having a thickness such as to provide a web with a weight of from about 0.05 to 0.75 pounds per square foot, and functioning as a relatively thick protective covering layer for said adhesive layer.

4,141,188

WALL CONSTRUCTION

Ronald D. Sukolics, St. Louis, Mo., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Feb. 10, 1978, Ser. No. 876,666
Int. Cl.[2] E04B *2/88*; E04H *1/00*
U.S. Cl. 52—395 **20 Claims**



1. A framing member for a wall construction including one or more glazing panels comprising:

an elongated structural element having an outwardly facing outer wall with a longitudinal recess along the center of an outer face thereof and an inwardly extending wall joined to said outer wall along a line offset from the center,

an elongated glazing element having an outer face parallel of said outer wall forming at least one glazing pocket therebetween for receiving an edge portion of one or more glazing panels, said element including a tongue extending inwardly of said outer face toward said recess and forming a wall, said flange having a longitudinal groove along an inside edge of said glazing pocket; and

fastening means for securing said glazing element and said structural element together with said tongue aligned, said fastening means including a spacer of heat insulating material having a head seated in said recess and a tongue at right angles thereto seated in said groove, and a screw fastener having a head on the inside of said outer wall and a threaded shank extended therethrough into threaded engagement within said groove of said tongue.

4,141,189

METHOD OF AND MEANS FOR SEALING EXPANSION AND CONTRACTION JOINTS OF BUILDINGS AND PAVEMENTS

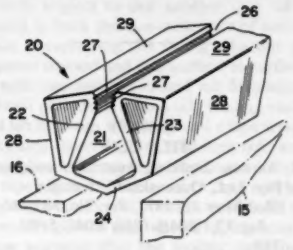
Jan T. Borjeson, 3250 Laguna St. #104, San Francisco, Calif. 94123

Filed May 20, 1977, Ser. No. 799,104
Int. Cl.[2] E04B *1/68*; E01C *11/10*
U.S. Cl. 52—396 **3 Claims**

3. In a sealing member for installation in an expansion and contraction joint of given maximum width and given minimum height, which sealing member comprises a preformed elongated body of elastic material having a hollow cross-section and being of greater width than said maximum width of said joint and lesser height than said minimum height of said joint, the improvement comprising:

(a) an elongated rectilinear opening through the wall of said hollow cross-section of said elongated body of elastic material parallel to the axis of elongation of said body; and

(b) a plurality of engagement means on said elongated body of elastic material on opposite sides of said opening adapted to cooperate with each other when in engagement to transmit stresses imposed on said body on one side of said opening to the other side of said opening; and



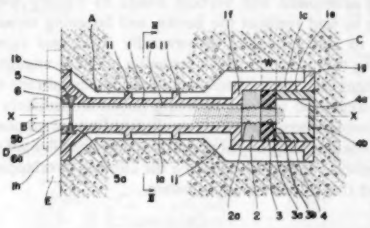
(c) the internal surfaces of said hollow cross-section of said elongated body of elastic material defining a generally diamond shape figure having an acute angle thereof at said opening and said body being symmetrical on opposite sides of a plane passing through the apex of said acute angle.

4,141,190

BOLT-SEATING PLUG

Saburo Shimada, Nishinomiya, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Oct. 21, 1977, Ser. No. 844,364
Claims priority, application Japan, Oct. 21, 1976, 51-142036[U]
Int. Cl.[2] E04B *1/41*
U.S. Cl. 52—711 **5 Claims**



1. A bolt-seating plug comprising

a cylindrical body made of rigid synthetic resin having a central portion which defines a central hole with a diameter slightly greater than that of a bolt to be inserted, and a fixture block which is provided in integral continuation to the inner end of said central portion and defines an inner chamber communicating with said central hole and having a polyhedron configuration with greater transverse dimensions than the cross-sectional area of said central hole on the provision of a shoulder wall between said central hole and inner chamber, a seal element provided in the entrance of said central hole to seal hermetically a gap between said central portion and bolt,

a metal nut which is accommodated in and has an outer surface in contact with said shoulder wall of said inner chamber and defines a threaded through-hole for permitting said bolt to be screwed therethrough,

a ring made of soft synthetic resin which is accommodated in said inner chamber, contacts with the inner surface of said

nut and has an through-hole for permitting said bolt to be bitten therethrough, and

a retainer element which is accommodated in said inner chamber, keeps said ring and nut in the outermost portion of said inner chamber, and defines an open space large enough to permit unhindered entry thereinto of the end portion of said bolt.

4,141,191

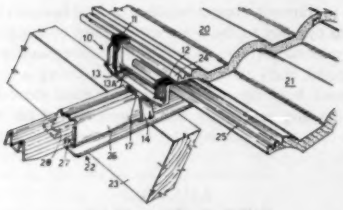
TILE CLIP

Raymond J. Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Queensland, Australia

Filed May 31, 1977, Ser. No. 802,016

Int. Cl.[2] E04B *1/38*; E04C *5/00*

U.S. Cl. 52—715 **4 Claims**



1. A tile clip including a body of L shape cross section having a substantially horizontal crosspiece and an integral vertical flange, two resilient spaced tile hooks connected to and extending upwardly from said vertical flange generally in the plane thereof, said tile hooks being dimensioned to engage over the respective side edges of an upper tile and of a lower tile of a pair of overlapped tiles on a roof, reinforcing rib means on said crosspiece and vertical flange to rigidify the same relative to said resilient tile hooks, and fastening means connected to and extending downwardly from said crosspiece including two spaced resilient fastening hooks to engage opposite flanges on a tiling batten and a pressure membrane extending between said resilient fastening hooks immediately below said crosspiece to engage the top of said tiling batten positively to lock the fastening hooks against said opposite flanges on said tiling batten, thereby to fasten the tile clip and overlapping tiles engaged thereby to the tiling batten.

4,141,192

DOOR BRACE FOR FACILITATING HANGING

Pius Augustine, 5945 W. Mississippi, Denver, Colo. 80226

Filed Mar. 27, 1978, Ser. No. 890,059

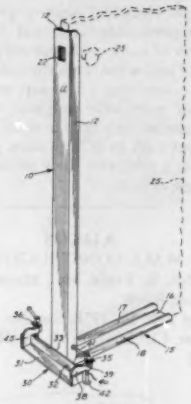
Int. Cl.[2] G01B *3/14*; E04F *21/00*

U.S. Cl. 52—749 **4 Claims**

1. A door brace for facilitating hanging a door, comprising:

(a) an L-shaped member comprising a first channel member rigidly secured to a second channel member at 90° with the channels secured with their opening on the same side to permit the channels to encompass both edges of a 90° corner of a door;

(b) a lateral member secured to said L-shaped member adjacent the intersection of said first and second channel members, extending outwardly from said L-shaped member providing lateral support for said L-shaped member in generally upright position, and;



(c) height adjustment means at the outer ends of said lateral member, and including means for individually raising and lowering the outer ends of said lateral member.

4,141,193

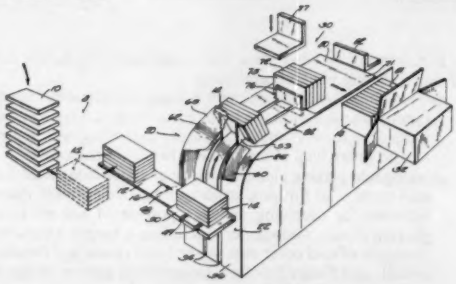
HORIZONTAL DIAPER GROUPER

Curt G. Joa, Box 1121, Boynton Beach, Fla. 33435

Filed Jul. 12, 1977, Ser. No. 814,948

Int. Cl.[2] B65B *63/02*

U.S. Cl. 53—529 **8 Claims**



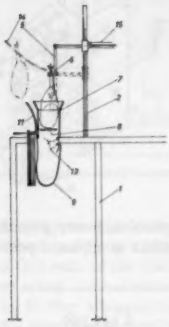
1. In apparatus for packing pads including means for stacking pads in vertical stacks the improvement comprising orienting and grouping means for tipping the pad stacks to place the pads on edge and group two stacks together in a horizontal array on a skid plate, said orienting and grouping means including conveyor means having transverse conveying runs, means for loading vertical stacks in sequence on said conveying means, said conveyor means including flights which traverse a generally vertical run and a curved run connecting said vertical and horizontal runs with said flights being indexible to a horizontally extending stack loading position for receiving a pad stack from said means for stacking pads and being indexible to a group forming station along said horizontal run, pad stop means associated with said skid plate, a pressure plate, pressure plate movement means for advancing and retracting said pressure plate transversely into and from the path of movement of said pads along said horizontal run and said skid plate, said pressure plate movement means including carriage means to move said pressure plate toward said pad stop means to compress pads against said stop means, and means for discharging said horizontal array of grouped and compressed pads as a unit laterally into a container from said skid plate.

4,141,194

MACHINE FOR PACKAGING CHICKENS

Zur Rochman, 53 Hashmonaim St., Tel-Aviv, Israel

Filed Sep. 20, 1977, Ser. No. 835,117
Claims priority, application Israel, Feb. 2, 1977, 51377
Int. Cl.[2] B65B *63/02, 43/36*
U.S. Cl. 53—529 **5 Claims**



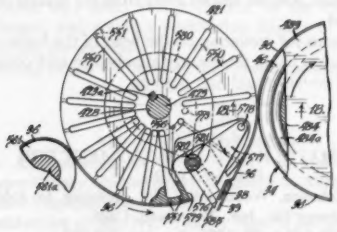
1. A machine for packaging a chicken whose legs remain attached to its body into an inflatable plastic bag comprising: (a) means for gripping a chicken above its knee joints such that the body hangs downwardly therefrom, (b) a hopper located below said gripping means, said hopper being provided with a transversely removable bottom portion and an open upper end sufficiently large to receive a chicken therewithin, (c) means for lowering said gripping means a sufficient distance to insert the chicken into the hopper until the chicken contacts the bottom portion of said hopper and thereafter an additional distance to compress the legs against the body, (d) means for providing an open ended plastic bag below the bottom portion of said hopper with the open end of said bag in receiving condition under said bottom portion and (e) means for transversely removing the bottom portion of the hopper and deactivating the gripping means thereby to drop the chicken into said bag with its legs lying adjacent the body.

4,141,195

METHOD AND APPARATUS FOR FORMING A TAMPER-PROOF CLOSURE FOR A CONTAINER

Martin Mueller, Wonderlake, and David St. Clair, Wilmette, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 575,537, May 8, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 826,004
Int. Cl.[2] B65B *61/18*
U.S. Cl. 53—412 **16 Claims**



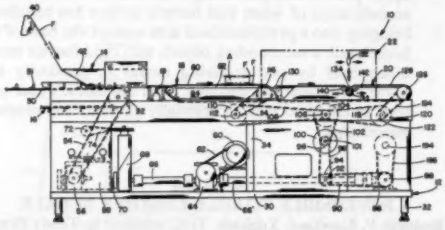
1. The method of serially forming sealed containers comprising the steps of: intermittently advancing a series of open topped containers along a horizontal processing path; positioning a closure means in sealing engagement with the open top of each container, so that a seam is provided at a level between each closure means and its container; providing a supply of heat shrinkable thermoplastic tape having a tacky side and a non-tacky side; intermittently feeding along a tape path predetermined lengths of tape from said supply each length having a dimension greater than the peripheral dimension of said container at the level of said seam; said feeding operation includes the steps of applying a transverse force to each tape length by drawing a portion of each tape by suction adjacent one end thereof during dwell periods of tape advancement to deflect a portion of said tape length out of said tape path and place adjacent portions of the tacky side of the tape in face-to-face relationship with respect to one another in a tab formation chamber located in back the non-tacky side of said tape along said tape path; compressing the facing adjacent portions of each tape segment toward and into surface-to-surface adherent engagement with one another in said tab formation chamber during said dwell periods to form a tab; feeding each length of tape with said tab between a feed roll and a tape wrapping head with the tacky side thereof facing said feed roll; and severing each tape length from the supply of tape outwardly of said tab to provide a tape segment having a free tape end beyond said tab; elevating said container to position its seam in a tangential relationship with respect to said tape wrapping head and wrapping each tape segment after the feeding operation about a container at the level of its seam, with the tacky side of said tape facing said container during a dwell period of container advancement by rotating the container about its own axis, whereby said tape segment is positioned in adhesive engagement with a container and its closure means, and said free end is positioned in overlapping adhesive engagement with an opposite end of the tape segment, said folded portions defining an integral gripping tab to facilitate removal of said tape segment from said container and said free end preventing premature removal of said tape segment and applying heat to said tape during the rotation of the container to shrink the same into tight engagement with said container and closure means.

4,141,196

SEAL WRAPPING MACHINE

Kenneth R. Blanding, Cedar Springs, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Filed Oct. 11, 1977, Ser. No. 841,303
Int. Cl.[2] B65B *9/06, 51/26, 61/06*
U.S. Cl. 53—550 **12 Claims**



12. A packaging machine for packaging articles in film stock comprising:

horizontal article conveying means for conveying spaced articles along a plane of travel; film advancing means for advancing film with articles on said article conveying means; vertically reciprocable film joining means movable vertically relative to said article conveying means for joining film stock between articles on said article conveying means; said film joining means comprising an upper transverse element and a cooperative lower transverse element, said elements both being vertically reciprocable in strokes from a spaced relationship above and below said plane of travel to an abutment relationship on film stock therebetween to join the film stock between articles; and a stroke adjusting control means operably connected to both said upper and lower elements for simultaneously

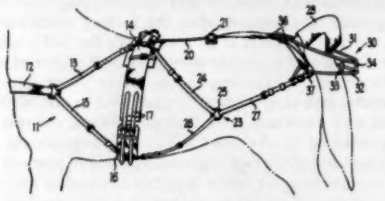
altering the vertical positions of both said elements in said abutment relationship to accommodate articles of differing sizes, while still maintaining the same position of said lower transverse element when in said placed relationship; and drive means operably connected for driving both said article conveying means and said film advancing means and including relative speed ratio drive elements to advance said film advancing means at a slightly faster rate than said article conveying means to provide controlled slack in the film between the articles for joining of the film.

4,141,197

GUARD FOR A HORSE'S TAIL IN A TAIL SET

William C. Nichols, 36W788 Red Gate Rd., St. Charles, Ill. 60174

Filed Jan. 5, 1977, Ser. No. 756,894
Int. Cl.[2] B68B *5/00, 5/04*
U.S. Cl. 54—1 **7 Claims**



1. A guard to prevent damage to a horse's tail while in a tail set comprising:

(A) a shaped elongated rigid barrier means with first and second ends, each of said first and second ends having an upper portion and a lower portion; and

(B) retaining means, coupled to said upper portions of said ends and to a tail set, for holding said elongated barrier means onto said tail set in proximity to the rear quarters and the base of the tail of a horse, said lower portion of said ends, when said retaining means hold said barrier means in proximity to a horse's rear quarters, being located lower than and at a fixed nonzero distance from said upper portion and providing to a horse to which attached an indication of when said horse's motion has resulted in bringing into a predetermined area around the base of said horse's tail, a surrounding object, said rigid barrier means, when held by said retaining means in proximity to a horse's rear quarters, defining, with said horse's rear quarters, an enclosed area substantially equal to said predetermined area.

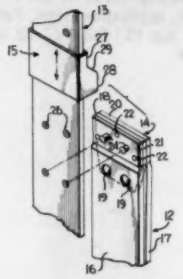
4,141,198

REVERSIBLE STIRRUP LEATHER BUCKLE

Rudolph F. Gaertner, Yoakum, Tex., assignor to Tandy Brands, Inc., Fort Worth, Tex.

Filed Jul. 29, 1977, Ser. No. 820,152
Int. Cl.[2] B68C *1/16;* **A44B** *11/20*
U.S. Cl. 54—46 **8 Claims**

1. An adjustable stirrup leather comprising a buckle leather and a billet leather, said buckle leather having a buckle end including a projecting buckle plate having at least one pin extending transversely therethrough and projecting at one side of said buckle plate, the fit of said pin in said buckle plate being one wherein said pin may be shifted through said buckle plate for selecting that side of said buckle plate from which said pin extends, said billet leather including an end portion having a plurality of spaced apertures therein for selectively receiving said pin and thereby determining the effective length of said stirrup leather, and a slide telescopically carried by said billet leather and slideable over said buckle plate to retain said billet leather engaged on said pin, said slide being removably carried by said billet leather and rotationally positionable thereon wherein said billet leather may be selectively positioned in front of and to the rear of said buckle leather in accordance



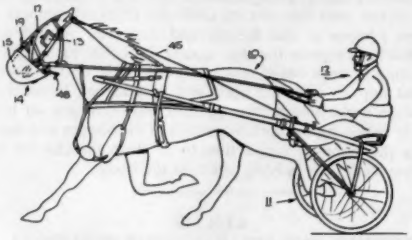
with the adjusted length of said stirrup leather and the amount of the excess billet leather in adjusted position of said stirrup leather.

4,141,199

APPARATUS TO PROTECT THE BREATHING OF A HORSE

Francis Doino, Jr., 277 E. Barkley Pl., North Brunswick, N.J. 08902

Filed Jul. 18, 1977, Ser. No. 816,718
Int. Cl.[2] B68C *5/00*
U.S. Cl. 54—80 **11 Claims**



1. An apparatus to protect the breathing of a horse comprising

a rigid self-supporting cover;

means having said cover pivotally mounted thereon to permit movement of said cover on the head of a horse between a first position spaced over the muzzle of the horse and a second position spaced away from the muzzle of the horse; and

a release means for mounting on the head of the horse, said release means being releaseably attached to said cover to hold said cover in said first position.

4,141,200

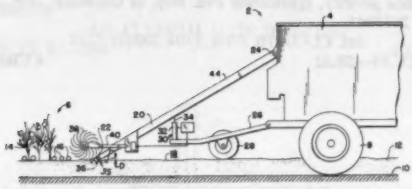
AUTOMATIC HEADER ADJUSTMENT FOR HARVESTERS

Howard B. Johnson, Woodland, Calif., assignor to Johnson Farm Machinery Co., Inc., Woodland, Calif.

Filed Oct. 27, 1976, Ser. No. 736,032
Int. Cl.[2] A01D *46/20, 75/28*
U.S. Cl. 56—10.2 **10 Claims**

7. A harvester movable through a field for harvesting a crop growing in the field comprising in combination a crop processing apparatus including means for moving the apparatus over the field in a foward direction; a crop elevator having a leading edge disposed forward of the apparatus and in relatively close proximity of the ground and extending rearwardly and up-

wardly from the leading edge for transporting crop from the ground to the apparatus; and means for raising and lowering the leading edge at a substantially constant position relative to the ground as the harvester moves through the field, the raising and lowering means including a sensor wheel disposed forward of the leading edge, said wheel being rotatable about



a substantially horizontal axis and connected to the elevator portion, the sensor wheel including a hub and tines projecting from the hub so that free ends of the tines contact the ground and rotate the wheel when the harvester moves through the field, the tines having further a longitudinally convex surface oriented to face in the direction of rotation of the wheel when the harvester moves through the field.

4,141,201

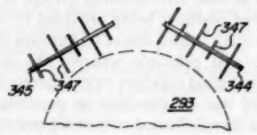
APPARATUS FOR CUTTING TOPS FROM PLANTS

Steven H. Christensen, 803 E. Melody Dr., Gilbert, Ariz. 85234

Continuation-in-part of Ser. No. 594,225, Jul. 9, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,256

Int. Cl.[2] A01D *23/04*

U.S. Cl. 56—121.42 **34 Claims**



1. Apparatus for cutting tops from onions in an onion bed, comprising, in combination:

frame means movable over an onion bed;

rotating lifting means secured to the frame means for lifting onion tops, and including

rotating lifting fingers for lifting and fluffing the onion tops from the onion beds, and

rotating positioning fingers for positioning the onion tops for cutting;

blade means secured to the frame means for cutting the onion tops lifted and positioned by the rotating lifting fingers and rotating positioning fingers of the rotating lifting means; and

cleaning means for cleaning the rotating positioning fingers.

4,141,202

MOWING IMPLEMENT

Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 775,041, Mar. 7, 1977, abandoned, which is a continuation of Ser. No. 722,487, Sep. 13, 1976, abandoned, which is a continuation of Ser. No. 536,742, Dec. 27, 1974, abandoned. This application Oct. 21, 1977, Ser. No. 844,303

Int. Cl.[2] A01D *55/18*

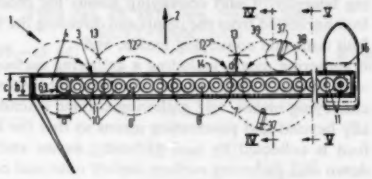
U.S. Cl. 56—295 **23 Claims**

1. A mowing implement adapted to be transported in closely overlying relation to ground surface while cutting a swath of standing crop, comprising in combination:

an elongate housing having a selected narrow width so as easily to pass beneath the crop being cut;

a series of gears disposed within said housing in serially meshing arrangement, said series of gears comprising a plurality of driving gears disposed in uniformly spaced relation and a set of idler gears disposed between each adjacent pair of driving gears;

a shaft connected with each driving gear and projecting upwardly through said housing and rolling bearing means journalling each such shaft for rotation about an axis fixed with respect to said housing;



a member fixed to the upper end of each shaft and sweeping a circular path having a diameter much greater than said width of the housing, the spacing between said driving gears being such that said circular paths do not overlap, a cutter carried by each member and projecting therefrom such that each cutter sweeps a second circular path which overlaps the path swept by an adjacent cutter; and

idler rolling bearing means journalling each idler gear for rotation about an axis fixed with respect to said housing, each idler gear forming the outer race of its associated idler bearing means.

4,141,203

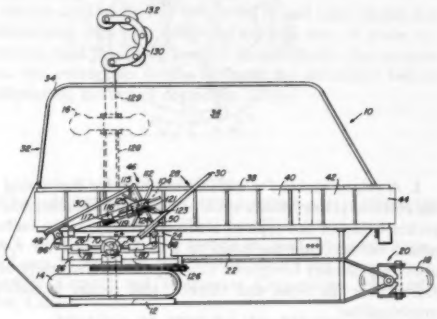
FRUIT HARVESTER

Benjamin O. Keillor, Wasco, Calif., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 649,017, Jan. 14, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,126

Int. Cl.[2] A01D *46/24*

U.S. Cl. 56—328 R **18 Claims**



1. A machine for harvesting fruit comprising,

a mobile frame,

an upwardly extending frame member positioned on said mobile frame,

first and second shaker means rotatably supported by said upwardly extending frame member for imparting oscillating horizontal rectilinear movement upon the limbs of the plants to be harvested,

said first and second shaker means being positioned in spaced relation on said mobile frame,

said first and second shaker means each including penetrat-

ing means extending outwardly from said frame member and adapted to extend into contact with the limbs of the plants and generate an undulating movement of the limbs to dislodge the fruit therefrom,

drive means drivingly connected to said first and second shaker means for oscillating said first and second shaker means in timed relation to each other to dislodge the fruit from the plants,

conveying means positioned for conveying the harvested fruit on said mobile frame,

gathering means supported by said mobile frame and extending laterally of said conveying means for receiving the fruit harvested from the plants and directing the harvested fruit onto said conveying means, and

said gathering means including a gathering surface extending outwardly from and sloping downwardly toward said conveying means, said gathering surface extending laterally beyond said penetrating means so that the harvested fruit is collected by said gathering means and directed down said gathering surface thereof onto said conveying means.

4,141,204

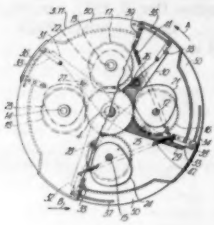
ROTARY PICKER FOR HARVESTING FRUIT

Michael H. Kuryluk, 7 Cornwall St., Lower Sackville NS, Canada (B4C 1J2)

Filed Mar. 17, 1977, Ser. No. 778,728

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **12 Claims**



1. A rotary picker for use in a machine for harvesting fruit on relatively low plants such as low bush blueberries, said picker being of the type of a driven, rotary drum, including means for securing the drum to a mobile frame for rotation about a generally horizontal axis disposed transversely of said frame near the front end thereof, said picker including, in combination:

transmission means for driving said drum to rotate in said predetermined direction;

a plurality of generally straight rows of cantilevered tines, said rows being each disposed near the periphery of said drum, extending in a generally axial direction relative to said drum, and being generally equidistantly spaced from one another and from the axis of rotation of said drum;

means for imparting to each of said rows an oscillatory movement relative to said drum along a predetermined, arcuate locus;

said arcuate locus being a segment of a cylindric surface generally coaxial with the axis of rotation of said drum.

4,141,205

STRANDING PROCESS AND APPARATUS

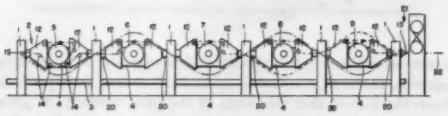
Dietrich Berges, Marienheide; Ulrich Saam, Gummersbach; Robert Führer, and Bodo Damzog, both of Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,446

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2653041

Int. Cl.[2] D07B *3/00, 3/04;* D01H *1/10*

U.S. Cl. 57—58.32 **4 Claims**



1. A stranding process for the production of a cable composed of multiple groups of plied filaments, which process comprises the steps of:

feeding individual filaments from separate feed positions located on a common extended linear twisting axis for plying into at least two different groups of filaments, at least two feed positions being provided for each group;

plying and twisting at least one of said groups of filaments by the double-twist principle wherein the individual filaments are first plied together from separate feed positions in a forward take-off direction on or along the twisting axis and are then deflected outwardly and returned backwardly in a rotating pattern around the separate feed positions; and

twisting all of said groups of filaments by the cable-twist principle wherein each group of filaments is directed axially in said backward direction beyond the feed positions to be joined in a common twisting zone for plying and twisting together into said cable.

4. Apparatus for plying and stranding multiple groups of filaments into a cable by double-twist twisting and by cable-twisting in one operation, which apparatus comprises:

a plurality of feed spools to supply individual filaments, each of said spools being rockingly mounted on cradle means at spaced positions along a twisting axis which extends longitudinally of the apparatus;

rotor means in axial alignment with said twisting axis for synchronous rotation with reference to each of said feed spools;

first guide means including at least some guide elements fixed to said rotor means to direct at least two separate groups of filaments from corresponding groups of feed spools backwardly in a rotating pattern around the feed spools;

second guide means to direct at least one of said separate groups of filaments for plying in a forward take-off direction from the corresponding group of feed spools together with deflecting means to then direct the resulting plied filaments outwardly and backwardly into said rotating pattern for double-twist twisting; and

cable-twisting means at the rear outlet end of the apparatus to receive the backwardly directed separate groups of filaments for twisting into a cable.

4,141,206

YARN TEXTURING MACHINE

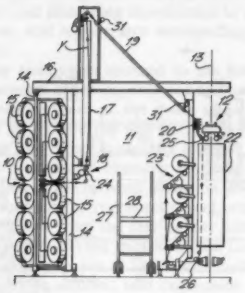
Ronald S. Eaves, Chapel-en-le-Frith, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Continuation of Ser. No. 779,938, Mar. 21, 1977. This application Mar. 31, 1978, Ser. No. 893,326

Claims priority, application United Kingdom, Mar. 23, 1976, 11595/76

Int. Cl.[2] D01H *13/28*; D02G *1/02*

U.S. Cl. 57—290 **4 Claims**



1. In a yarn texturing machine, a combination comprising a creel section comprising at least one upright row of yarn supply packages, said row having an upper and a lower end; a texturing section comprising package winders and at least one false twister, said texturing section being on the same level as and transversely spaced from said creel section and defining therewith an operator aisle; at least one upright setting heater mounted adjacent to said creel section and having an outlet upwardly spaced from said upper end and an inlet located a substantial distance above floor level, and at least one elongated yarn stabilizing and cooling guide spanning said aisle and extending from the vicinity of said outlet inclined down to said false twister, whereby the yarn is positively guided over substantially the entire distance from said inlet to said false twister.

4,141,207

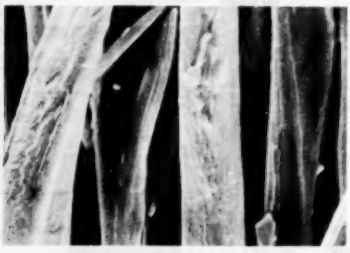
PROCESS FOR PRODUCING CURL SHRUNK SILK YARN

Shigesaburo Mizushima, No. 98-11, Notobeshimo, Rokuseimachi, and Hiroshi Kosugi, No. 26, Kuritaya, Kanagawa-ku, both of Japan

Filed Sep. 2, 1977, Ser. No. 830,317

Int. Cl.[2] D02G *1/00*

U.S. Cl. 57—243 **2 Claims**



1. A process for producing a curl shrunk silk yarn, comprising the sequential steps of (a) removing sericin from raw silk material, (b) absorbing collagen derived protein into said raw silk material, (c) twisting the silk fibers, (d) saturating the fibers with water, (e) maintaining said water saturated silk fibers at temperature of 130° to 140° C. and under a pressure of 3 to 3.5 atmospheres for 10 to 20 minutes, (f) untwisting said silk fibers in the reverse direction and (g) treating said silk fibers in saturated water vapor whereby said silk fibers are provided with a uniform curl shrinkage.

4,141,208

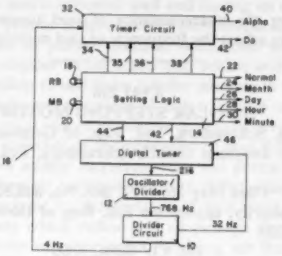
DIGITALLY TUNED TIMEPIECE

John N. Whipple, Santa Ana; Norman E. Moyer, and Irving B. Merles, both of Newport Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 19, 1976, Ser. No. 650,335

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 AC **8 Claims**



1. In a device requiring a fixed frequency, a frequency adjusting system for subtracting pulses from a wavetrain to obtain a predetermined frequency of sufficient accuracy, said means comprising:

an oscillator for providing a wavetrain at a constant frequency that is slightly higher than a predetermined value;

logic means, connected to receive said wavetrain from said oscillator, for removing pulses from the oscillator wavetrain;

manually operable means, connected to said oscillator, for controlling the removal of pulses, said means being programmable to change the average rate of pulse removal in accordance with a correction factor having a plurality of individually alterable portions;

an electro-optical display, connected to said logic means, for displaying data indicating the average rate of pulse removal, said display indicating alphabetically the portion of the correction factor available for alteration before displaying the actual correction factor.

4,141,209

CRYSTAL CONTROLLED OSCILLATOR AND METHOD OF TUNING SAME

James V. Barnett, Cupertino; Donald R. Duff, Mountain View, and Larry D. Wickwar, San Mateo, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 27, 1976, Ser. No. 754,483

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 A **2 Claims**

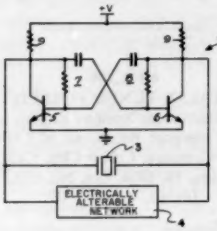
1. A crystal controlled oscillator circuit such as are used for electronic watches and the like which can be automatically adjusted by electrical impulses comprising:

(a) a transistor multivibrator circuit,

(b) a quartz crystal operably connected with said transistor multivibrator circuit to stabilize the operating frequency of said multivibrator, and

(c) a tuning circuit operably connected with said crystal and said multivibrator circuit to adjust said operating frequency, said tuning circuit including an arrangement of

electrically alterable resistors and capacitors each of which may be selectively destroyed by electrical impulses



to alter the characteristics of said turning circuit and thereby adjust the frequency of said multivibrator circuit.

4,141,210

BIPOLAR STEPPING MOTOR

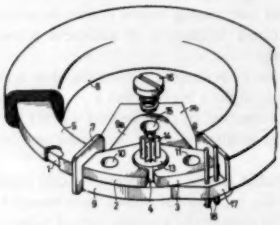
Hans Flaig, Schramberg, Fed. Rep. of Germany, assignor to Februder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,528

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623298

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 D **7 Claims**



1. In a bipolar stepping motor, especially for use in watches, including a stator member having opposite ends, said stator member being of one-piece construction from one of said ends to the other, said ends being spaced to form an air gap between the ends of the stator member, a rotor disposed between the ends of the stator member and forming a nonconstant air gap with those ends, said rotor including a shaft, and a coil encompassing a portion of the stator member, said one-piece stator member is of annular configuration, a coil carrier surrounding said stator member over a substantial portion of its end-to-end extent, said coil being applied on said carrier to define a ring core winding, a carrier plate attached to the stator member adjacent said air gap, said plate carrying said shaft of the rotor and serving as means for attaching the motor to another structure.

4,141,211

TRAVERSING DEVICE IN A CHAIN MANUFACTURING PLANT

Stig Svensson; Carl-Henning Camitz, and Stig Lindgren, all of Ramnäs, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Dec. 23, 1977, Ser. No. 864,038

Claims priority, application Sweden, Dec. 30, 1976, 7614749

Int. Cl.[2] B21L *7/00*

U.S. Cl. 59—16 **5 Claims**

1. A traversing device for use in a plant for the manufacture of chains having a rectilinear production line with a plurality of work station, comprising

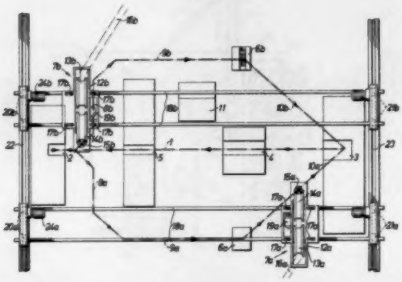
(a) a guide means extending along at least one side of said production line and being substantially parallel to said production line;

(b) at least one traverse beam for mounting said guide means;

(c) stationary traverse guides arranged perpendicularly to said production line for carrying said at least one traverse beam;

(d) a carriage for carrying a chain end under production, said carriage being movable along said guide means;

(e) said guide means and said carriage movable therealong being movable transversely relative to said production line;



(f) said traverse guides having a length such that said carriage, in a first position of said guide means, can move along the latter with said chain end hanging down on said production line, and, in a second position of said guide means, retracted from said production line, can move along said guide means with said chain end hanging down at a distance from said production line sufficient to permit said chain end to avoid said work stations on said production line without being hoisted, thereby permitting the insertion of at least one further work station laterally of said rectilinear production line.

4,141,212

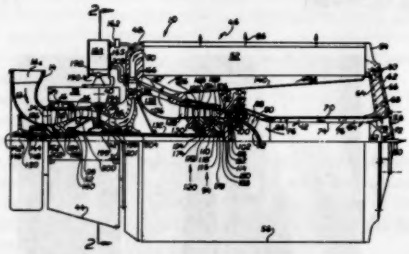
DIFFERENTIALLY GEARED REGENERATIVE REVERSE FLOW TURBO SHAFT ENGINE

Angelo F. Koschier, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jun. 20, 1977, Ser. No. 808,263

Int. Cl.[2] F02C *3/10, 7/10*

U.S. Cl. 60—39.16 R **13 Claims**



1. A gas turbine engine having forward and rear portions comprising:

a housing having an interior duct through which air may pass, said duct having upstream and downstream portions relative to the direction of airflow through the duct;

a compressor shaft rotably mounted within the housing, said compressor shaft being constructed with a coaxial interior passage;

a compressor impeller mounted on the compressor shaft for

rotation therewith, said impeller extending into the interior duct to increase the velocity of the air flowing in the duct upon rotation of the impeller, said impeller discharging the airflow radially;

a forward header secured to the housing downstream of the compressor and having an interior passage forming part of the duct, said interior passage connected to receive the radially flowing air from the compressor and constructed to diffuse said airflow and direct it axially rearward;

an annularly shaped regenerator mounted in the housing downstream of the diffuser, said regenerator forming part of the duct and being connected to receive the rearward flowing air and also being constructed to transmit heat to said airflow, said regenerator surrounding a radially interior cavity;

a rear header removably secured to the housing rearward and downstream of the regenerator and having an interior passage forming part of the duct, said interior passage connected to receive the rearward flowing air from the regenerator and direct it radially inward;

a cylindrical combustion chamber mounted in the housing and extending in the forward direction within the interior cavity of the annular regenerator and constructed to receive the airflow from the rear header passage, said combustion chamber having means to mix fuel with the airflow, and having means to ignite said mixture in order to rapidly heat the airflow, said combustor exhausting the rapidly heated airflow in the forward direction;

a power turbine shaft rotably mounted within the housing and extending toward the forward portion of the engine through the inner passage of the compressor shaft;

a power turbine mounted within the regenerator cavity on the power turbine shaft for rotation therewith, said power turbine having blades extending into the interior duct in the path of the heated forward flowing air from the combustor, the airflow exerting a force on said turbine blades to cause rotation of the power turbine shaft;

a compressor turbine mounted within the regenerator cavity on the compressor shaft for rotation therewith, said compressor turbine having blades extending into the interior of the duct downstream of the power turbine in the path of the heated forward flowing air from the power turbine, the airflow exerting a force on said compressor turbine blades to cause rotation of the compressor shaft;

a differential gear assembly mounted in the forward portion of the engine and interconnected to the power turbine shaft and the compressor shaft to provide a forward power output to utilize the power imparted to the turbine shaft by the airflow; and

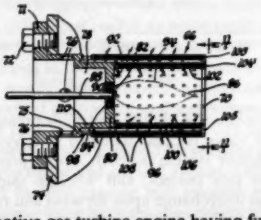
means for radially exhausting the airflow from the duct downstream and forward of the compressor turbine through the regenerator to provide heat thereto.

4,141,213

PILOT FLAME TUBE

Phillip T. Ross, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1977, Ser. No. 809,290
Int. Cl.[2] F02C *7/18, 7/26*
U.S. Cl. 60—39.67 **4 Claims**



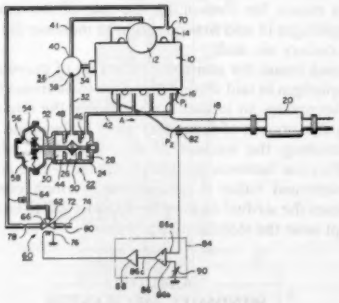
1. In an automotive gas turbine engine having fuel flow to a prechamber liner of a combustor for a prevaporization upstream of a combustor wall surrounded by a compressed air source and with the wall defining a primary combustion zone the improvement comprising: a continuously operated pilot flame tube assembly supported on the combustor wall to maintain a continuous ignition flame within the primary combustion zone during engine deceleration, said assembly including a dome located exteriorly of the wall and having an interior bulkhead defining an upstream air space therebetween in communication with said air chamber, a pilot air swirler on said bulkhead including a pilot nozzle for continuously directing fuel and air downstream of said bulkhead for ignition as a continuously burning pilot flame located within said combustor wall for continuously igniting air fuel mixtures within said primary combustion zone, a double-walled open end flame tube surrounding said pilot ignition flame, said flame tube located within said combustor wall and having an outer tubular member of porous material with holes therein and an inner tubular member of porous material with holes therein, said inner tubular member being telescoped within and located in spaced relationship to said outer tubular member to form an air passage therebetween upstream of holes in both said tubular members, said inner and outer tubular members having one end thereof sealed together at the open end of said flame tube to prevent air flow axially therefrom into said primary combustion zone, cooling air entrance means to direct compressed air from said air source to the surfaces of said inner and outer tubular members which define said air passage therebetween, said inner tubular member holes receiving air from said air passage for redistributing air as a sheath radially inwardly of said inner tubular member to continuously shield it from said pilot flame, said outer tubular member holes receiving air from said air passage for redistributing air as a sheath radially outwardly through said outer tubular member to shield it against a flame within said combustor primary combustion zone thereby to maintain a continuous pilot flame within said primary combustion zone to prevent flameout therein during engine decelerations wherein air and fuel flows are reduced to the primary combustion zone.

4,141,214

EXHAUST GAS CLEANING APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Tadao Mitsuda, Susono; Takeru Yasuda, Nagoya, and Yoshiki Fukumori, Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 11, 1977, Ser. No. 823,758
Claims priority, application Japan, Jun. 28, 1977, 52-76174
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—276 **2 Claims**



1. An exhaust gas cleaning apparatus for an internal combustion engine, said apparatus comprising:

a three-way catalytic converter arranged in the exhaust system of the engine, which converter effectively eliminates toxic components remaining in the exhaust gas when the air fuel ratio is kept near a stoichiometric value;

air pump means driven by the crankshaft of the engine;

pipe means connected, on one end thereof, to the air pump means for receiving secondary air from the pump means and connected, on the other end thereof, to the exhaust system at a position located upstream of the catalytic converter for introducing secondary air into the exhaust system;

a flow control valve disposed in the pipe means for controlling an amount of the secondary air directed toward the exhaust system via the pipe means, which valve having a diaphragm for forming a vacuum chamber on one side thereof, and the opening of the flow control valve being controlled in accordance with the vacuum pressure level in the vacuum chamber;

a vacuum switching valve of an electromagnetic type having a common port, a first switching port and a second switching port, the valve being capable of switched between a first position in which the common port communicates with the first port and a second position in which the common port communicates with the second port;

pressure signal conduit means for connecting the common port with the vacuum chamber;

first pressure signal conduit means for introducing a first pressure signal into the first port, which signal is one of an atmospheric pressure signal from the atmosphere and a vacuum pressure signal from the intake system of the engine;

second pressure signal conduit means for introducing a second pressure signal into the second port, which signal is the other of said atmospheric pressure signal and said vacuum pressure signal;

a sensor means in the form of an oxygen concentration-cell which is arranged in the exhaust system and which detects a predetermined value of air-fuel ratio which is higher than said stoichiometric air-fuel value;

a control unit for operating the electromagnetic valve in such a manner that electromagnetic the valve is in its first position when an electric signal, which indicates that the air fuel ratio is smaller than the predetermined value, is received by the unit to cause a first pressure signal to be transmitted into the vacuum chamber for moving the diaphragm in a first direction to increase the amount of secondary air passed through the flow control valve, and in such a manner that the electromagnetic valve is in its second position when another electric signal, which indicates that the air-fuel ratio is larger than said predetermined value, is received by the unit to cause a second pressure signal to be transmitted into the vacuum chamber to move the diaphragm in a second direction opposite to said first direction to decrease the amount of secondary air passed through the flow control valve;

a first means for controlling the rate of movement of the diaphragm in said first direction to increase the amount of secondary air, and;

a second means for controlling the rate of movement of the diaphragm in said second direction to decrease the amount of secondary air in such a manner that the rate of decreasing the amount of secondary air is higher than the rate of increasing the amount of secondary air, whereby the difference between the stoichiometric value and the predetermined value is compensated, which compensation causes the air-fuel ratio of the exhaust gas to be effectively kept near the stoichiometric value.

4,141,215

WINDMILL MECHANISM

Concepcion Cadalzo, 80 Van Wagenen Ave., Jersey City, N.J. 07306

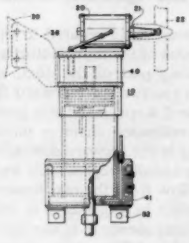
Filed Jun. 8, 1977, Ser. No. 804,713
Int. Cl.[2] F16D *31/02*; F04B *17/02, 35/02*
U.S. Cl. 60—398 **2 Claims**

1. A windmill power generator comprising

a hydraulic rotary pump mounted on top of a tower, with rotary wind responsive means fixed to the impeller of said pump so as to drive said pump,

a piston and cylinder assembly mounted to said tower above the base of said tower and joined to said hydraulic pump so that fluid circulated by said pump causes the piston to move in a first direction.

a piston shaft, mounted so as to travel in a reciprocal vertical direction in said tower, said shaft linked to the said piston so as to travel in fixed relation with said piston, with the weight of said shaft biasing the piston to travel in a second direction opposed to said first direction a fluid reservoir being mounted between the hydraulic pump and the cylinder assembly, with said reservoir being in fluid communication with a chamber of the cylinder assembly and a port of the pump,



the reservoir being fitted with an inlet pipe and an outlet pipe with the outlet pipe of the reservoir joined to the intake port of the rotary pump, and with the chamber of the cylinder assembly, from which fluid is expelled when the piston travels in the said first direction, joined to the inlet pipe of the reservoir,

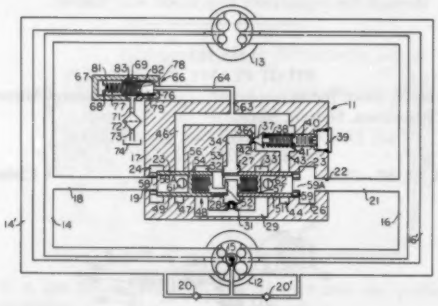
in which both inlet and outlet pipes of the reservoir extend into the interior of the reservoir, with the opening inside of the reservoir of the inlet pipe being at a higher elevation than the opening inside the reservoir of the outlet pipe.

4,141,216

COMBINATION SHUTTLE AND HIGH-PRESSURE RELIEF VALVE

William K. Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 20, 1977, Ser. No. 798,952
Int. Cl.[2] F15B *21/04*
U.S. Cl. 60—454 **10 Claims**



1. In a combination shuttle and high pressure relief valve, wherein said valve is communicated to a hydraulically actuated pump-motor system on both a high pressure side and a low pressure side thereof, and wherein said high and low pressure sides interchange upon forward and reverse operation of said system; valve spool means in said valve comprising first and second spool portions, slideable within a valve bore, with

said high and low pressure side means interconnecting said spool portions to move both said spool portions to that portion of said bore next adjacent the low pressure side of said system, collapsible means between said two spool portions to hold said spool portions apart under normal pressure conditions in said system means responsive to excess pressure in said system, operative to cause collapse of said collapsible means and permit said two spool portions to shorten their collective effective lengths, and means in said spool and said valve to communicate excessively high pressure fluid from the high pressure side of said system into the low pressure side of said system upon the shortening of the effective collective lengths of said spool portions.

4,141,217

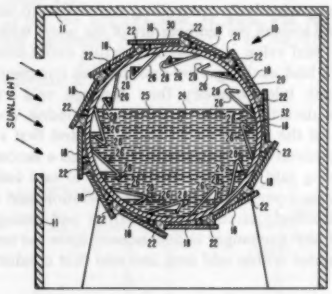
Patent Not Issued For This Number

4,141,218

BUOYANCY OPERATED SUNMILL

Eric R. Rayboy, Apartment #J-215, 11273 N. Kendall Dr., Miami, Fla. 33176

Filed Nov. 23, 1977, Ser. No. 854,461
Int. Cl.[2] F03G 7/02
U.S. Cl. 60—641 **7 Claims**



1. A sun-powered engine comprising:

(a) a sealed, cylindrical drum having a shaft extending from each end along its longitudinal axis, said drum containing a gas and a fluid;

(b) a pair of support members rotably supporting each end of said drum and allowing said drum to rotate about its longitudinal axis;

(c) a plurality of vanes extending from the cylindrical wall of said drum into the interior of said drum, each vane being fixed to said cylindrical wall at an acute angle in the direction in which said drum is intended to rotate, there being a hooked portion at the interior end of each of said vanes, said hooked portion being adapted to capture some of said gas as the hooked portions of said vanes transit from said gas into said fluid with the rotation of said drum; and

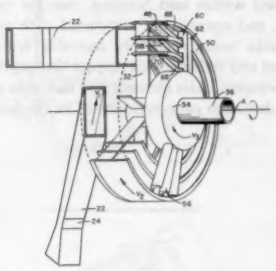
(d) means for heating said gas held by selected ones of said vanes whereby the heated gas will expand displacing some of said fluid thereby causing said selected ones of said vanes to become more buoyant than others of said vanes whereby said drum will rotate.

4,141,219

METHOD AND TURBINE FOR EXTRACTING KINETIC ENERGY FROM A STREAM OF TWO-PHASE FLUID

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to the invention of David G. Elliott, La Canada, Calif.

Filed Oct. 31, 1977, Ser. No. 847,278
Int. Cl.[2] F01K 25/04, 21/00
U.S. Cl. 60—645 **20 Claims**



8. In an improved turbine for a two-phase fluid, the improvement comprising:

A. means adapted to receive a stream of fluid flowing along a linear path consisting of a liquid phase and a vapor phase; and

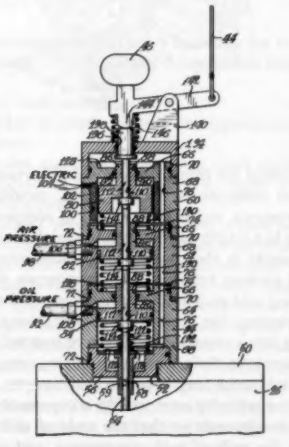
B. means for separating the liquid phase from the vapor phase of said fluid including means for redirecting the liquid phase to an annular path and the vapor phase to a path axially related to the annular path.

4,141,220

MULTIPLE INPUT, SINGLE OUTPUT MECHANICAL ACTUATOR

Dennis D. Feucht, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 5, 1977, Ser. No. 857,066
Int. Cl.[2] F01B 21/04; F02B 73/00
U.S. Cl. 60—698 **11 Claims**



1. A multiple input, single output, mechanical actuator comprising:

a housing;

an actuator rod reciprocally mounted in said housing and having one end projecting therefrom;

a plurality of aligned, signal responsive elements in said housing, each independently mounted for reciprocation therein towards and away from said rod;

a plurality of signal input means in said housing, one for each said element, for applying a force to reciprocally move the associated element towards or away from said rod; and

a plurality of aligned, interengaging links reciprocally mounted within said housing, one for each of said elements, and operatively associated with said rod, each of said links being relatively movable with respect to its element and slidable with respect thereto for one direction of movement of its element and movable therewith in the other direction of movement of its element.

4,141,221

MEANS FOR FITTING PACKING BETWEEN TWO COMPONENTS, SUCH AS PIPES, CAPABLE OF RELATIVE MOVEMENTS, IN PARTICULAR COAXIAL MOVEMENTS

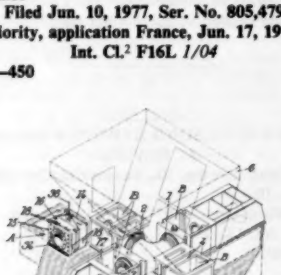
Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprises d'Equipments Mecaniques et Hydrauliques E.M.H., Boulogne, France

Filed Jun. 10, 1977, Ser. No. 805,479

Claims priority, application France, Jun. 17, 1976, 76 18407

Int. Cl.[2] F16L *1/04*

U.S. Cl. 29—450 **14 Claims**



1. In a method for fitting or removal of a resilient packing between two components, such as pipes, capable of relative coaxial movements, including the steps of compressing axially said packing to a length smaller than the axial distance between said components in their working position, introducing said compressed packing between said components and then partially releasing said packing from the stress resulting from said axial compressing, the improvement comprising introducing said packing into a cassette adapted to be inserted between the two components in their working position, compressing said packing to said axial length within said cassette, introducing said cassette containing said axially compressed packing between said components so that the ends of said packing are opposite to the ends of said components, and releasing said packing to enable it to bear with pressure by its axial ends against said ends of said components, the same operations being effected in the reverse order for removal of said resilient packing from between said two components.

4,141,222

ENERGY RECOVERY SYSTEM FOR REFRIGERATION SYSTEMS

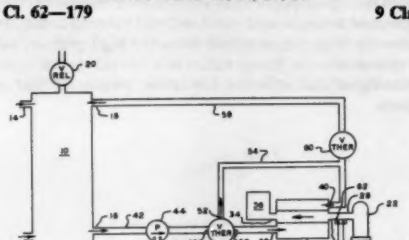
David A. Ritchie, Altamonte Springs, Fla., assignor to WeatherKing, Inc., Orlando, Fla.

Continuation of Ser. No. 791,541, Apr. 27, 1977, abandoned.

This application Mar. 29, 1978, Ser. No. 891,464

Int. Cl.[2] F25B *13/00, 29/00*

U.S. Cl. 62—179 **9 Claims**



1. An energy recovery system for heating with by-product heat from a refrigeration system comprising, in combination, an electrically driven refrigeration compressor having a hot compressed gas outlet conduit and electric controls, a hot water storage tank having an inlet and an outlet, a heat exchanger heated by said hot gas conduit and having an inlet and an outlet, a first conduit communicating with said storage tank outlet and connected to said exchanger inlet, an electric pump within said first conduit operatively associated with said compressor whereby energizing of said pump only occurs during operation of said compressor, a temperature sensing diverting valve within said first conduit intermediate said pump and said heat exchanger selectively controlling water flow to said heat exchanger and sensing the temperature of the water within said first conduit, said valve including a diverting outlet communicating with a heat exchanger by-pass conduit communicating with said tank inlet whereby flow through said valve is through said diverting outlet and by-pass conduit upon the temperature of the water within said valve and first conduit attaining a predetermined maximum value, and a second conduit connecting said heat exchanger outlet to said tank inlet whereby during compressor and pump operation said diverting valve selectively circulates water from said storage tank through said heat exchanger in dependence upon the temperature of the water within said tank and said first conduit.

4,141,223

ENCAPSULATED REFRIGERATOR

Jan Dyhr, Sonderborg, and Ole J. Nissen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 7, 1977, Ser. No. 849,111

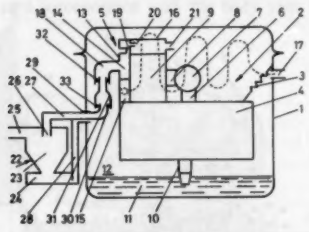
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650936

Int. Cl.[2] F25B *1/02, 31/00;* **B25B** *43/02*

U.S. Cl. 62—469 **6 Claims**

1. An encapsulated refrigerator assembly, comprising, a capsule having an oil sump at the bottom thereof, an integrated motor unit and compressor unit mounted in said capsule, said compressor unit having first and second compressor inlet means, port means in said capsule, fluid passage means between

said port means and said first compressor inlet means, said second compressor inlet means having direct fluid communication with the interior space of said capsule, and throttle means for said second compressor inlet means.

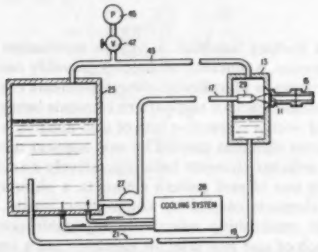


4,141,224

CLOSED LOOP SPRAY COOLING APPARATUS

Donald L. Alger; William B. Schwab, both of Cleveland, and Edward R. Furman, North Olmsted, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 672,220, Mar. 31, 1976, Pat. No. 4,068,495.
This application Aug. 31, 1977, Ser. No. 829,315
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—514 R **2 Claims**



1. A closed loop apparatus for spraying a radiation target with liquid coolant comprising:

a loop for circulating the liquid coolant including a coolant reservoir, a gastight chamber communicating with the target, and first and second tubular connections between the reservoir and the chamber for circulating the liquid coolant therethrough;

means disposed within the chamber and connected to one of the tubular connections for spraying the liquid coolant against the back of the target;

said chamber containing vaporized coolant;

a vacuum line interconnecting the reservoir with the chamber;

an isolation valve; and

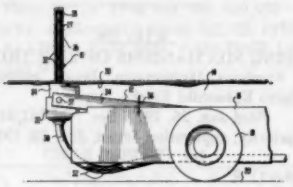
a pump communicating with the vacuum line through the isolation valve.

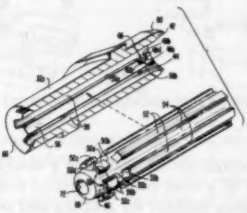
4,141,225

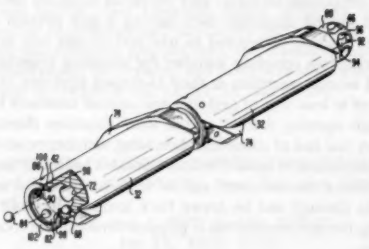
ARTICULATED, FLEXIBLE SHAFT ASSEMBLY WITH AXIALLY LOCKABLE UNIVERSAL JOINT

Horace M. Varner, Littleton, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 10, 1977, Ser. No. 767,260
Int. Cl.[2] F16C *1/02*
U.S. Cl. 64—2 P **13 Claims**







1. In an articulated, flexible shaft assembly for transmitting torque in response to a rotational drive means torquing said shaft,

a plurality of shaft sections,

ball and socket members carried on opposite ends of said shaft sections,

ball and socket members of adjacent shaft sections being interconnected in said assembly to form a universal jointed articulated assembly,

means interposed between the ball and socket members of said interconnected adjacent shaft sections effecting driving engagement between said shaft sections when one shaft section is rotated relative to another, said assembly having an intermediate portion, constituted by at least a shaft section which is clamped radially by said drive means for applying torquing rotation to said assembly by way of said driving engagement effecting means, said intermediate portion having interconnected therewith at a leading end thereof a shaft portion of a further portion of said assembly and at a trailing end thereof a shaft section of a still further portion of said assembly,

the improvement comprising:

means interposed between said ball and socket members of said interconnected, adjacent shaft sections for causing the shaft sections of said further portion to lock up in an

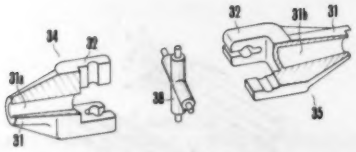
axial straight alignment when said assembly is torqued by rotation in one direction, and to transmit torque with a limited free angular inclination therebetween when said assembly is torqued by rotation in the other direction, whereas the shaft sections of said still further portion is caused to transmit torque with a limited free angular inclination therebetween when said assembly is torqued by rotation in the said one direction.

4,141,226

OPERATING MECHANISMS OF ELECTRIC DEVICES

Yasumasa Sasahara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 26, 1977, Ser. No. 762,941
Claims priority, application Japan, Jan. 29, 1976, 51-8197[U]
Int. Cl.[2] F16D *3/26*
U.S. Cl. 64—17 R **10 Claims**



1. In an electric device including a rotary component element rotated by a shaft coupled thereto, and a manually controlled operating member for rotating said shaft, the improvement comprising rotational coupling means including at least one universal coupling for connecting said operating member to said component element, said universal coupling including first and second members each having a hub portion and a U-shaped portion connected to one end of said hub portion, and a crisscross coupling member for coupling together said first and second members at their U-shaped portions, the hub portion of at least one of said first and second members having a through opening formed in the axial direction thereof for receiving one end of either said operating member or said shaft and dimensioned to make frictional contact with the received end whereby the received end is allowed to move axially, penetrate through and be drawn back into said through opening along the axis thereof but is gripped firmly in the rotational direction.

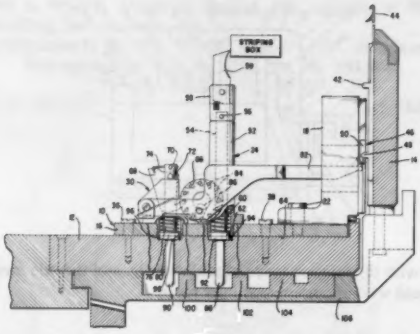
4,141,227

PLATE ASSEMBLY FOR A CIRCULAR KNITTING MACHINE

Lester Mishcon, deceased, late of Miami Beach, Fla. (by Martha Mishcon, executrix), and Harry Agulnek, Miami Beach, Fla., assignors to Vanguard Supreme Machine Corporation, Monroe, N.C.

Filed Sep. 14, 1977, Ser. No. 833,196
Int. Cl.[2] D04B *15/53, 15/76*
U.S. Cl. 66—229 **3 Claims**

1. In a circular knitting machine, an actuator assembly for a striping box including a movable plunger; a cam section block including an adjustable needle actuating cam; a device for positioning said adjustable needle actuating cam, said positioning device including a plunger for initiating operation thereof; a plate having said actuator assembly for said striping box, said cam section block, and said cam positioning device mounted thereon; a ring to which said plate is secured; control camming under said ring; a pin actuable by said control camming, said pin including an enlarged flange with a plunger engageable flat upper surface adapted to engage and move said plunger of said striping box actuator assembly; another pin actuable by said control camming, said another pin including an enlarged flange with a plunger engageable flat upper surface adapted to engage and move said plunger of said cam positioning device; and said ring including recesses for receiving said enlarged flanges of said pins so that the plunger engageable flat upper surfaces



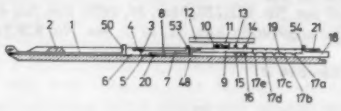
thereof are flush with the upper surface of said ring in the unactuated positions of said pins.

4,141,228

PATTERN MECHANISM FOR A FLAT BED KNITTING MACHINE

Reinhold Schimko, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,352
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656824
Int. Cl.[2] D04B *7/00*
U.S. Cl. 66—75.1 **15 Claims**



1. In a knitting machine, a pattern mechanism comprising support means, a plurality of needles movably carried by said support means, a plurality of pattern elements carried by said support means, each of said pattern elements being operatively associated with a respective one of said needles, a plurality of first selector elements carried by said support means, each of said first selector elements being operatively associated with a respective one of said pattern elements, a plurality of second selector elements carried by said support means, connection means for establishing selectively adjustable connection between each of said first selector elements and a respective one of said second selector elements, a cam element on each of said second selector elements, cam means adapted for operative engagement with said cam elements, means mounting said cam means for movement relative to said support means to effect said operative engagement with said cam elements, a hook means on each of said first selector elements, a slide member manually movable across the needle bed, and groove means formed in said slide member for operative engagement with said hook means.

4,141,229

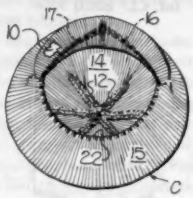
KNIT CAP WITH ELASTIC HEAD BAND

L. Harold Sharpe, Albemarle, N.C., assignor to Stanly Knitting Mills, Inc., Oakboro, N.C.

Filed Oct. 11, 1977, Ser. No. 840,767
Int. Cl.[2] A42B *1/04;* D04B *1/24*
U.S. Cl. 66—171 **10 Claims**

1. In a visored cap including a crown knit of body yarn

stitches and a lower edge providing a band adapted to engage the head of the wearer, and a visor extending throughout a minor portion of said band, the combination therewith of elastic yarn incorporated with the body yarn stitches in the



major portion of said band and floating across the body yarn stitches substantially throughout the minor portion of said band, said elastic yarn being sufficient to draw the major portion of said band into resilient engagement with the head of the wearer.

4,141,230

JACQUARD CONTROLLED WARP KNITTING MACHINE WITH SLIDABLE THREAD GUIDES

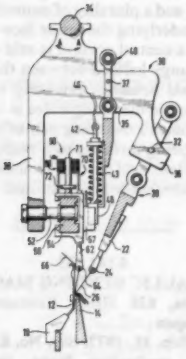
Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinen Fabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,599

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707015

Int. Cl.[2] **D04B** *23/00, 27/00*

U.S. Cl. 66—204 **9 Claims**



1. In a jacquard controlled warp knitting machine comprising

(a) at least one needle bed provided with needles,

(b) at least one ground stitch guide bar having guides attached thereto,

(c) a plurality of jacquard droppers,

(d) a jacquard arrangement for controlling said jacquard droppers,

(e) at least one pattern guide bar, and

(f) drive means for said machine, the improvement which comprises

(i) a plurality of guides slidably mounted on said pattern guide bar,

(ii) tabs attached to guides, said tabs being positioned to be interactable with the jacquard droppers upon activation thereof by the jacquard arrangement,

(iii) clamping and declamping means for clamping said guides to and releasing said guides from said pattern guide bar,

(iv) activating means for activating and deactivating said clamping means.

4,141,231

MACHINE FOR APPLYING PATTERNS TO A SUBSTRATE

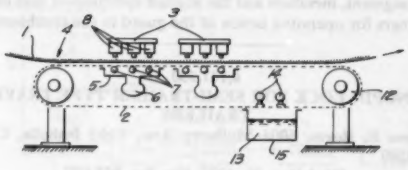
Hans Kudlich, Kufstein, Austria, assignor to Maschinenfabrik Peter Zimmer Aktiengesellschaft, Kufstein, Austria

Filed Jul. 28, 1976, Ser. No. 709,550

Claims priority, application Austria, Jul. 28, 1975, 5812/75

Int. Cl.[2] **B05B** *7/00;* **B05C** *5/00;* **D06B** *1/02*

U.S. Cl. 68—205 R **20 Claims**



1. A machine for applying a pattern to a substrate, comprising:

applicator means including at least one nozzle for spraying dyestuff onto a substrate to be patterned, said nozzle being provided with a discharge orifice and with valve means for controlling the rate of discharge of dyestuff through said orifice;

transport means including a perforated conveyor for moving said substrate past said nozzle in the immediate vicinity of said orifice, said transport means including a support roller confronting said nozzle for backstopping a portion of said substrate sprayed with said dyestuff; and

suction means for drawing said portion of said substrate onto said conveyor in the vicinity of said nozzle.

4,141,232

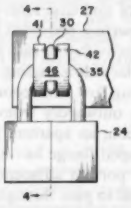
GUARD AND LOCKING COMBINATION THEREWITH

Richard L. Kelly, 8761 Matilija Ave., Panorama City (L. A.), Calif. 91402

Filed Aug. 1, 1977, Ser. No. 820,923

Int. Cl.[2] **E05B** *67/38*

U.S. Cl. 70—54 **42 Claims**



1. A combination for a locking purpose comprising

a staple or the like having a cavity therein,

a hasp slotted for a cooperative fit in a closed position to said staple or the like, and

a guard having an open end for slip-on connection over said staple or the like with the hasp in closed position and comprising

spaced rigid members in secured relationship to each other, each of said members having a thickness through which an aperture is co-extensively disposed, each aperture in alignment with the other,

said rigid members being spaced so as to constitute a void providing for the aforementioned slip-on connection,

at least one rigid segment securing said members and maintaining them in such spaced relationship,

said segment not being formed or disposed in the thickness of said members in which the aforementioned apertures are formed and disposed, and

a face on each of said members at the open end of the guard for substantial physical abutment upon the hasp in closed position,

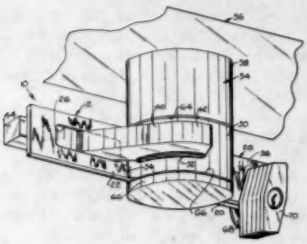
said segment being in relationship with the aligned apertures and said spaced rigid members such that the staple or the like of the locking combination substantially displaces such void when said guard is slipped over such staple or the like and such staple or the like lies between said rigid segment, members and the aligned apertures of said members for operative action of the guard in the combination.

4,141,233

KINGPIN LOCK FOR SEMI-TRAILER TYPE TRAVEL TRAILERS

Eugene E. Reyes, 6004 Mulberry Ave., Lake Isabella, Calif. 93240

Filed Dec. 30, 1977, Ser. No. 865,997
Int. Cl.[2] F16B *41/00*
U.S. Cl. 70—232 **1 Claim**



1. A lock for a semi-trailer kingpin having upper and lower ends constituting a major diameter of said kingpin and a reduced-diameter intermediate portion, whereby an upper shoulder, an annular groove and a lower shoulder are formed on said kingpin, said lock comprising:

a first locking collar half including a first semi-annular body portion having first and second ends, first and second flanges extending radially outwardly from said first and said second ends of said first semi-annular body portion, respectively, an aperture provided in said first flange and an elongated slot provided in said second flange;

a second locking collar half including a second semi-annular body portion having first and second ends, a third flange extending radially outwardly from said first end of said second body portion, an aperture provided in said third flange and a S-shaped flange having a first end affixed to said second body portion adjacent its second end and a second end adapted to pass through said elongated slot in said second flange and abut said second flange when said first and second semi-annular body portions encompass said annular groove with said first and third flanges in abutting relationship to thereby minimize the likelihood that a pry-bar may be inserted between said second end of said S-shaped flange and said second flange, the width, thickness and radius-of-curvature of each of said body portions being such that said body portions will fill said annular groove between said upper shoulder and said lower shoulder without protruding beyond said major diameter of said kingpin; and

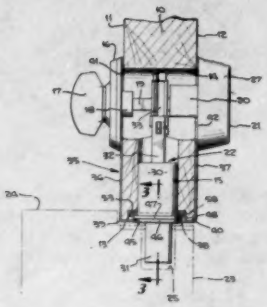
a padlock hasp passing through said apertures in said first and third flanges for maintaining said body portions in said locked, encompassing relationship in said kingpin groove.

4,141,234

DEAD BOLT GUARD

Paul R. Hoos, South Gate, Calif., assignor to Norris Industries, Inc., South Gate, Calif.

Filed Mar. 1, 1978, Ser. No. 882,341
Int. Cl.[2] E05B *9/08*
U.S. Cl. 70—350 **5 Claims**



1. A guard mount structure for a dead bolt installation on a door wherein a dead bolt assembly has a bolt head and an operating mechanism, and a housing for accommodation of the bolt head with an end edge adjacent said head, and wherein the door has inside, outside and end faces,

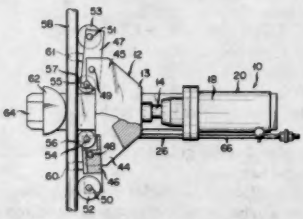
said structure comprising a cage having an outside plate for the outside face, an inside plate for the inside face and an end plate for the end face, said end plate having opposite edges in common with respective adjacent edges of the side plates, said end plate having a circular hole for the dead bolt head and a plurality of mounting holes, wings on said housing underlying the inside face of said end plate, a ferrule having a central portion in said circular hole and a perimetrical flange located between the end plate and an end edge of said housing, mounting holes in said wings opposite respective mounting holes in said end plate making in each instance a matching pair of holes, wall portions of said wings being directed to a position of engagement with said end plate, said pairs of mounting holes providing means for attachment together of said cage and said dead bolt assembly.

4,141,235

HYDRAULIC BENDING MACHINE

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan

Filed Sep. 16, 1977, Ser. No. 834,002
Claims priority, application Japan, Sep. 18, 1976, 51-125657[U]; Nov. 19, 1976, 51-155265[U]
Int. Cl.[2] B21D *9/05*
U.S. Cl. 72—213 **9 Claims**



1. In a hydraulic bending machine, comprising a bending means to abut against a workpiece to apply a bending force

thereto; a piston-cylinder hydraulic driving means provided with a reciprocating piston coupled with the bending means and a hydraulic cylinder containing the piston and having two chambers defined by the head of the piston; and guide means to hold the workpiece between itself and the bending means;

the improvement wherein:

the hydraulic driving means includes biasing means for biasing the piston to a retracted position;

and wherein the bending machine further comprises:

an oil hydraulic circuit means including an oil reservoir, a pump, a motor for operating the pump and feeding pressure oil in the oil reservoir into one of the chambers of the cylinder of said piston-cylinder driving means to protrude the piston, a switch for the motor, and a directional control valve coupled to said pump and to said cylinder and having a first port to allow the pressure oil to pass from the pump to one chamber of said cylinder and a second port to allow the pressure oil, forced out of one chamber by the biasing means and returning to the oil reservoir, to pass;

a rockable change lever coupled to said motor and directional control valve for switching on the motor and shifting the directional control valve so as to let the oil flow through the first port when rocked in one direction as well as for switching off the motor and shifting the directional control valve so as to let the oil flow through the second port when rocked in the opposite direction; and

automatic piston return means including a rod to protrude integrally with the piston according to the protrusion of the piston and a stopper arranged to abut against the change lever to rock the change lever in the opposite direction when the piston attached to the rod has protruded through a prescribed stroke.

4,141,236

HYDRAULIC SHOCK ABSORBER WITH OUT-OF-LIMIT INDICATOR

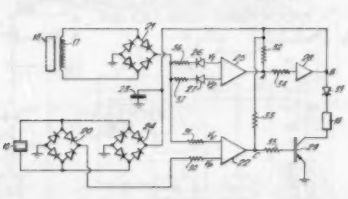
Kenneth L. Ellington, Sawbridgeworth, England, assignor to Koni B.V., Oud-Beyerland, Netherlands

Filed Oct. 25, 1977, Ser. No. 845,439

Claims priority, application United Kingdom, Oct. 26, 1976, 44412/76

Int. Cl.² G01M *17/04*

U.S. Cl. 73—11 **11 Claims**



1. An arrangement for measuring the force/velocity characteristic of a pair of parts in relative motion designed to produce a hydraulic force which is a function of the relative velocity of the parts comprising:

first means for generating a first signal corresponding to the relative velocity of said parts;

second means for generating a second signal representative of the hydraulic force developed by said parts;

third means for comparing the first and second signals and for generating an output signal when a predetermined relationship exists between said first and second signals;

fourth means for generating a visual indication in response to said output signal indicating when the force/velocity characteristic falls outside predetermined limits.

4,141,237

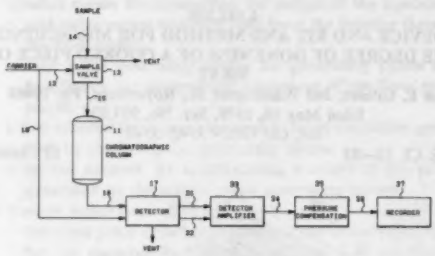
PRESSURE COMPENSATION METHOD AND APPARATUS FOR A CHROMATOGRAPH

Donald D. DeFord, Evanston, Ill., and Edwin K. Clardy, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 24, 1978, Ser. No. 880,923

Int. Cl.² G01N *31/08*

U.S. Cl. 73—23.1 **16 Claims**



1. In a chromatograph system for analyzing the composition of a sample, said chromatograph system having a separating column and a detector means for providing an output signal having an amplitude which varies in accordance with the sample composition, the improvement comprising apparatus for compensating for errors in said output signal, said errors being produced by changes in the barometric pressure for the system, said apparatus comprising:

means for generating a compensating signal which is representative of the effect on said output signal of the difference between the actual barometric pressure for the system and a reference pressure; and

means for combining said output signal and said compensating signal in such a manner that errors, in said output signal, caused by changes in barometric pressure for the system are reduced.

4,141,238

METHOD FOR THE DETERMINATION OF THE AMOUNT OF PARTICLES IN GASEOUS MEDIA AND A SAMPLING DEVICE FOR PERFORMING THE METHOD

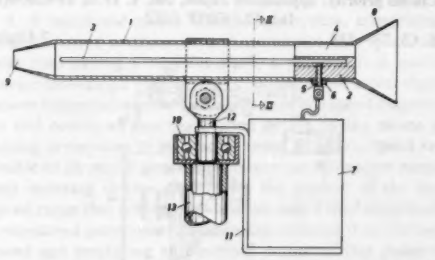
Bengt Steen, Gothenburg, Sweden, assignor to Institutet för Vatten- och Luftvårdsforskning, Stockholm, Sweden

Filed Apr. 11, 1977, Ser. No. 786,366

Claims priority, application Sweden, Apr. 15, 1976, 7604454

Int. Cl.² G01N *15/00, 1/22*

U.S. Cl. 73—28 **3 Claims**



1. An apparatus for the isokinetic sampling of the amount of particles transported by a gaseous media, said apparatus comprising:

a cylindrical sleeve having an inner surface;

an electrode concentrically disposed in said sleeve;

an insulator for mounting said electrode in said sleeve and insulating said electrode from said sleeve;

voltage means for charging said electrode to a high voltage with respect to said sleeve; and

gas supply means for providing isokinetic gas flow through said sleeve, wherein said particles are charged and attracted to the inner surface of said sleeve, wherein said gas supply means comprises a rear end of said sleeve, as seen in the direction of flow, and has an expanded portion.

4,141,239

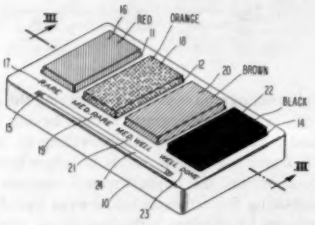
DEVICE AND KIT AND METHOD FOR MEASURING THE DEGREE OF DONENESS OF A COOKED PIECE OF MEAT

John E. Gilbert, 348 Washington St., Royersford, Pa. 19468

Filed May 18, 1978, Ser. No. 907,037

Int. Cl.[2] G01N *3/42, 3/48*

U.S. Cl. 73—81 **12 Claims**



1. A device for measuring the degree of doneness of a cooked piece of meat comprising:

a plurality of blocks of resilient material, each of said blocks having a known, predetermined, calibrated distinct amount of compressibility, said amount of compressibility of each of said blocks being equal to a corresponding amount of compressibility of a model piece of meat which has been cooked to a known standard degree of doneness, each of said blocks having an exposed surface which is adapted to be compressed for measurement of the amount of compressibility thereof, the differences in compressibility between the plurality of blocks being pre-selected to represent a range in degrees of doneness of a cooked piece of meat.

4,141,240

FLOW RATE MEASURING DEVICE

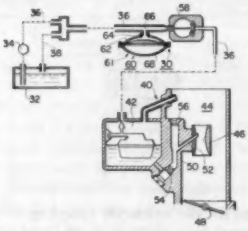
Keizaburo Usui, and Yoshikazu Hayakawa, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 28, 1977, Ser. No. 810,905

Claims priority, application Japan, Jul. 1, 1976, 51-85858[U]

Int. Cl.[2] G01F *1/72*

U.S. Cl. 73—114 **7 Claims**



1. A liquid fuel supply system for an internal combustion engine comprising:

a reservoir for storing liquid fuel;

a pump connected to the reservoir for pumping fuel therefrom;

a carburetor connected to the engine for charging the engine, said carburetor having a float chamber;

a fuel line connecting the pump to the float chamber of said carburetor for delivering pumped fuel thereto;

a flow rate sensor disposed in said fuel line between said pump and the float chamber of said carburetor, said flow rate sensor including oscillating means having a frequency of oscillation porportional to the rate of fuel flow through said fuel line, the oscillating means comprising a pivoted vane disposed in a cavity within said flow rate sensor which alternatively directs fuel to spaced outlet passages as the vane oscillates; and

a pressure accumulator inserted in the fuel line between the pump and the flow rate sensor in series with and upstream of the flow rate sensor for damping continuous periodic pressure pulsations generated in the fuel flowing through the fuel line due to operation of the pump, the pressure accumulator comprising a chamber having a pair of compartments separated by a movable wall wherein only one compartment is connected to the fuel line and the other compartment contains a compressible means for absorbing energy due to increases in fuel pressure and releasing the energy thus absorbed during decreases in fuel pressure so as to effect said damping.

4,141,241

ANALYZING EXHAUST GASES FROM AN INTERNAL COMBUSTION ENGINE

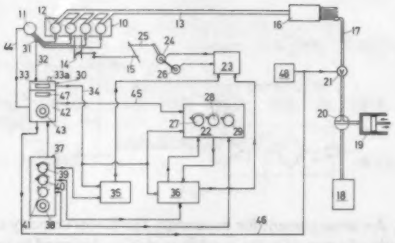
Lars T. Collin, Mölndal, Sweden, assignor to Collin Consult AB, Mölndal, Sweden

Filed Dec. 29, 1977, Ser. No. 865,488

Claims priority, application Sweden, Jan. 13, 1977, 7700285

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—117.3 **17 Claims**



1. A method of obtaining representatively comparable results, when analyzing exhaust gases from different vehicle internal combustion engines, comprising varying the engine fuel supply means according to a pre-selected test program to simulate varying operating conditions, in which a monitoring device, transferring the test program to the fuel supply means of the engine, is adjusted with respect to the rated power of the actual engine and the weight of the vehicle in which it is mounted in such a manner, that acceleration changes in the engine are governed so they substantially correspond with changes in speed of the vehicle, presupposed by the program.

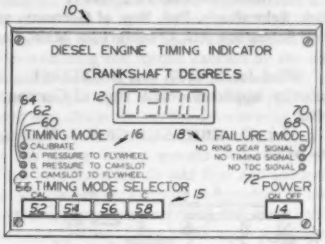
4,141,242
APPARATUS FOR DYNAMICALLY TIMING A DIESEL ENGINE

Ronald K. Scott, Buda, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 804,408, Jun. 7, 1977. This application Mar. 31, 1978, Ser. No. 892,222

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—117.3 **25 Claims**



1. A digital timing apparatus, comprising:

first means for receiving and digitizing a cyclically generated, oscillating reference signal having positive, negative and zero-crossover portions and a plurality of timing signals each having positive, negative and zero-crossover portions;

second means for selecting two of the plurality of timing signals and displaying the time therebetween in degrees of reference signal generation in decimal format;

third means for measuring the period of the digitized reference signal and measuring the time between the selected two digitized timing signals;

fourth means, coupled to the first, second and third means, for automatically controlling operation of the second and third means and automatically, controllably, systematically manipulating the digitized data.

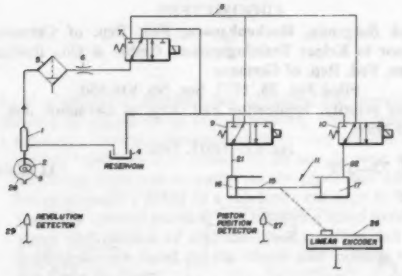
4,141,243
APPARATUS FOR TESTING THE VOLUMETRIC OUTPUT OF FUEL INJECTOR SYSTEM COMPONENTS

Norman L. Van Tassel, Pittsburgh, and Vladimir Lang, Monroeville, both of Pa., assignors to Bacharach Instrument Company, a division of AMBAC Industries, Inc., Pittsburgh, Pa.

Filed May 3, 1978, Ser. No. 902,419

Int. Cl.[2] G01F *9/00*

U.S. Cl. 73—119 A **8 Claims**



1. Apparatus for measuring the volumetric output of fuel injector system components comprising:

a supply of fluid for the fuel injector system component;

motor driven means for cyclically operating said fuel injector system component;

first pulse generating means for generating pulses as a function of the cyclic operation of the fuel injector system component;

a positive displacement flow meter having a piston reciprocally slidable in a cylindrical chamber and valve means at each end of the cylindrical chamber for introducing fluid to one end of the cylindrical chamber and exhausting fluid from the opposite end to drive said piston toward said opposite end of the cylindrical chamber and for alternately reversing the flow to drive the piston toward said one end;

conduit means for connecting the output of the injector to said valve means to direct fluid from the injector through the flow meter;

second pulse generating means for generating pulses as a function of the incremental movement of the flow meter piston;

a first counter for accumulating a count of the pulses generated by the first pulse generating means;

a second counter for accumulating a count of the pulses generated by the second pulse generating means;

control means responsive as said piston approaches a predetermined point adjacent each end of the cylindrical chamber for sequentially (1) inhibiting said first and second counters, (2) operating said valve means to reverse movement of said piston, and (3) reenabling said first and second counters; and

means responsive to the accumulation of a predetermined count in said first counter for sequentially storing and displaying the count accumulated in said second counter, and resetting both said first and second counters.

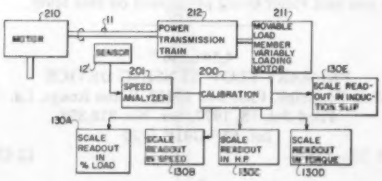
4,141,244
LOAD INDICATING METERING DEVICES FOR MOTOR DRIVEN LOADS

Robert F. Dumbeck, Elgin, Tex., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 675,780, Apr. 12, 1976, Pat. No. 4,063,112, which is a continuation-in-part of Ser. No. 548,011, Feb. 7, 1975, abandoned. This application Sep. 15, 1977, Ser. No. 833,651

Int. Cl.[2] G01L *3/00*

U.S. Cl. 73—133 R **16 Claims**

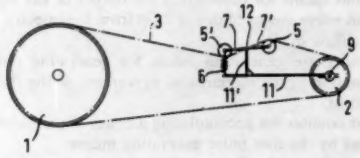


1. A monitored power transmission system, comprising in combination, a motor with a characteristic that speed varies with load having a movable shaft, a motor driven movable device providing a variable load coupled to said motor shaft by power transmission means for movement at a speed determined by said motor, an analog metering device having means producing in response to said motor speed an analog speed range visible on an output meter scale, electronic calibration means in said metering device conforming the portion of the motor speed range that corresponds to peak motor load conditions to a monitored parameter related to and different from the motor speed and producing an electrical output of that parameter, and means in said metering device responsive to said electrical output of that parameter operating said metering device for displaying on said visually readable scale said monitored parameter in calibrated units displaying the variable load condition imposed on said motor.

4,141,245
DEVICE FOR THE MEASUREMENT OF MECHANICAL WORK AND POWER

Heinz P. Brandstetter, Nietzschestrasse 15, 8000 Munich 40, Fed. Rep. of Germany

Filed May 27, 1976, Ser. No. 690,580
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1975, 2524605
Int. Cl.[2] G01L 5/06
U.S. Cl. 73—144 6 Claims

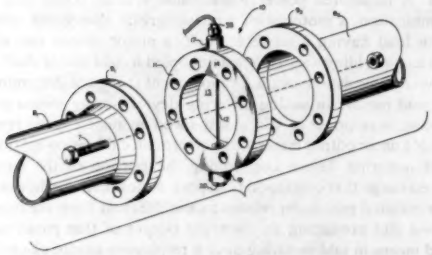


1. Apparatus for the measurement of mechanical work and performance transmitted by means of a flexible transmission element between two guide wheels, including:
(a) a first roller, said first roller being placed under a load, acting on one side of said transmission element and deflecting said transmission element in accordance with said load and with the traction in the transmission element;
(b) a second roller acting on the other side of said transmission element;
(c) a first device for measuring the deflection of said first roller and for producing a corresponding first signal;
(d) a second device for measuring the distance covered by said transmission member and its speed of travel, and for producing a corresponding second signal;
(e) one of the group of elements comprising said guide wheels and rollers comprising a sensor;
(f) a third device controlled by said first and second signals for producing a third signal corresponding to the said mechanical work and performance;
(g) said first and second rollers being supported on a structure which is swingably supported on the axis of one of said guide wheels and
wherein said structure includes a holder swingably positioned on the axis of one of the guide wheels joined by the transmission element, and a lever swingably positioned on the holder, at least one said roller being positioned on said lever.

4,141,246
PRIMARY FLOW SENSING DEVICE

Ellwood A. Randolph, P.O. Box 15432, Baton Rouge, La. 70895

Filed Jul. 18, 1977, Ser. No. 816,894
Int. Cl.[2] G01F 1/20
U.S. Cl. 73—194 B 12 Claims

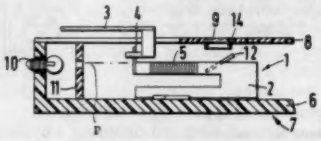


1. A primary sensing apparatus for measuring the rate, or changes in the rate of flow of a fluid which comprises
a tensioned elongated reed capable of resonating in a harmonic mode to produce nodes and antinodes in known relation to the amount of energy transmitted thereto and absorbed from said fluid,
a support means to which the ends of said elongated reed are affixed and held in tension, and
a means for sensing the harmonic pattern, and changes as the harmonic pattern shifts from one mode to another.

4,141,247
OPTICAL WARNING INDICATOR MEANS ON BIMETAL MEASURING ELEMENT

Horst Schlick, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 813,861
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634062
Int. Cl.[2] G01D 5/28; G01K 5/70
U.S. Cl. 73—363.5 6 Claims

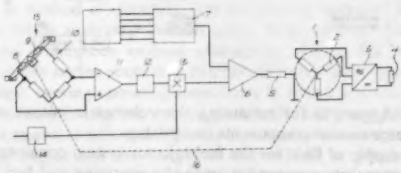


1. An indicator comprising housing means;
dial means supported on said housing means carrying scale indicia thereon and having a translucent section therein, said dial means including baffle means to prevent stray light from illuminating said translucent section;
a bimetal measuring element disposed in said housing means and movable therein in accordance with a condition to be sensed;
a pointer coupled with said measuring element and movable along said scale indicia on said dial in response to movement of said measuring element providing an indication of the condition to be sensed;
light means directing a light beam along a path through said housing means such that light from said beam is normally prevented from being received at said translucent section; and
reflector means carried by said measuring element and movable therewith to intersect said path of said light beam to reflect said light beam to said translucent section when a predetermined condition is sensed whereby said translucent section is illuminated only when said predetermined condition is sensed.

4,141,248
ERGOMETERS

Siegfried Bargenda, Rockenhausen, Fed. Rep. of Germany, assignor to Keiper Trainingsysteme GmbH & Co., Rockenhausen, Fed. Rep. of Germany

Filed Jun. 28, 1977, Ser. No. 810,850
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629516
Int. Cl.[2] G01L 5/02
U.S. Cl. 73—379 11 Claims



1. In an ergometer having a driving machine, said machine

including drive means for producing a rotational movement, said drive means including a rotatable drive shaft and force application means connected to said shaft and adapted to be directly engaged by a user for setting said drive means in rotational motion, a load device comprising a generator connected to the driving machine, a load connected to the output of the generator and a regulator controlling the electrical power dissipation of the load device on the basis of a comparison between a given nominal value produced by a nominal value transmitter and an actual value produced by an actual value transmitter, the improvement wherein said actual value transmitter comprises a first measurement transducer means directly coupled to said force application means of said drive means for determining the torque exerted by the user on said force application means of said drive means and for converting the measured torque into a first electrical signal, a second measurement transducer means for determining the speed of a component upon which the measured torque is applied and for converting the speed into a second electrical signal, and a multiplier means connected to said first and second measurement transducer means for forming the product of said first and second electrical signals representing the actual value of the power transmitted to said force application means by the user.

4,141,249

SUB-LANCE ASSEMBLY FOR SAMPLING AND TEMPERATURE-MEASURING OF MOLTEN METAL DURING REFINING

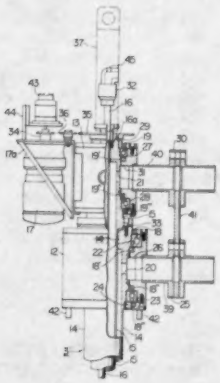
Kenkichi Ishikawa; Shinobu Kumagai; Teruyuki Hasegawa, and Akiyoshi Sakamoto, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,188

Claims priority, application Japan, Mar. 14, 1977, 52-26942; Mar. 18, 1977, 52-31985[U]

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—423 R **4 Claims**



1. In a sub-lance assembly for sampling and temperature-measuring of molten metal during refining, which comprises:

a sub-lance having a concentric three-pipe structure comprising from inside to outside an air supply pipe, a water discharge pipe and a water supply pipe, said sub-lance being releasably fitted to a sub-lance carriage in the substantially vertical position by a receiving stand fixed to the upper end portion of said sub-lance carriage and a supporting device fixed to the lower end portion of said sub-lance carriage;

a water supply outer cylinder having a water supply branch pipe, rotatably engaging with the upper end portion of said water supply pipe through a bearing mechanism and a sealing mechanism, said water supply pipe, said water supply outer cylinder and said water supply branch pipe communicating with each other in a water-tight manner;

a water discharge outer cylinder having a water discharge branch pipe, rotatably engaging with the upper end portion of said water discharge pipe through a bearing mechanism and a sealing mechanism, said water discharge pipe, said water discharge outer cylinder and said water discharge branch pipe communicating with each other in a water-tight manner, said water discharge outer cylinder being located above said water supply outer cylinder; and

a drive mechanism for rotating said sub-lance around the axial line thereof, said drive mechanism being fitted onto one of the outer surfaces of said water supply outer cylinder and said water discharge outer cylinder;

the improvement comprising:

a sub-lance rotation angle detector provided at the tip of the axis of rotation of said drive mechanism, said rotation angle detector being adapted to detect the angle of rotation of said sub-lance, and

a fixing plate integrally connecting said water supply branch pipe and said water discharge branch pipe, said fixing plate being located at a place near said water supply outer cylinder and said water discharge outer cylinder, said fixing plate being adapted, when rotating said sub-lance by said drive mechanism, to prevent said water supply outer cylinder and said water discharge outer cylinder from rotating together with said sub-lance.

4,141,250

PLURAL PISTON, ADJUSTABLE DILUTING DEVICE HAVING A VOLUME INDICATOR ASSEMBLY

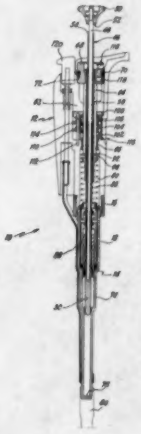
Eric M. D'Autry, 69-72 rue Gambetta, 95 Villiers-le-Bel, France

Filed May 2, 1977, Ser. No. 792,810

Claims priority, application France, May 10, 1976, 76 13939

Int. Cl.[2] G01N *1/14*; G01F *11/06*

U.S. Cl. 73—425.6 **10 Claims**



1. In an adjustable diluting device for mixing a determined volume of a liquid sample and a determined volume of a liquid diluent, at least one of these two volumes being variable, the combination of:

an oblong casing and a lower tapered tubular element or nose member made fast with said casing;

a mechanism for adjusting one of the two volumes of sample or diluent drawn up;

a unit for indicating the adjustable volume of sample or diluent drawn up, said indicator unit being coupled with said adjustment mechanism;

a plunger unit mounted for reciprocation in tight manner inside said casing and said nose member, said plunger unit itself comprising:

two coaxial pistons of which the first piston slides tightly

inside the nose member and the second piston slides inside a central recess made in the first piston;

a sleeve for controlling the first piston, and to cooperate with a stop for limiting the upward stroke of the first piston, said stop being elastically urged upwardly and being adjustable in vertical position by means of said adjustment mechanism;

a shaft for controlling the second piston, which may slide inside said sleeve controlling the first piston, and

a push button fixed to the upper end of said shaft for controlling the second piston, and having a stop surface cooperating with the upper end of the sleeve to control the first piston;

said casing internally defining a lower cylindrical chamber and an upper enlarged cavity, adjacent said latter, and incorporating said indicator assembly coupled with said adjustment mechanism, said latter comprising:

a hollow shaft externally cooperating by screwing with an insert fixed so as to be immobile in rotation and in translation inside said casing, said hollow threaded shaft comprising, near its lower end, said stop limiting the upward stroke of the first piston;

a nut for rotating said hollow threaded shaft, adapted to be actuated from outside the casing;

volume indicator rings bearing indices visible through a window made in the casing, said rings being fixed on said threaded shaft so as to surround it and allow it an alternative movement through the rings which moreover are equipped with drive means for controlling the relative movement of said rings depending on the movement of rotation of the hollow threaded shaft, and

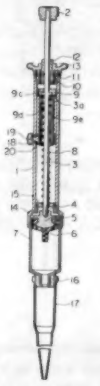
means for restricting the movement of said hollow threaded shaft for immobilizing said shaft in a chosen position.

4,141,251

PIPETTING DEVICE

Yuji Oshikubo, Sakura, Japan, assignor to Nichiryo Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,879
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **6 Claims**



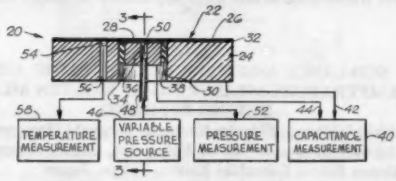
1. A pipetting device including a cylinder disposed at the lower end portion of a tubular housing coaxially therewith, a piston reciprocably fitted in the cylinder and having an actuating rod secured thereto to extend coaxially in the tubular housing, an actuating knob secured to the upper end of the actuating rod, a discharge nozzle connected to the lower end of the cylinder, and a return spring biasing the actuating rod in the upward direction, wherein the device further comprises a sleeve having a cylindrical portion on the upper end portion thereof for slideably and rotatably engaging with the inner periphery of the housing and a screw-threaded portion for engaging with a screw-threaded portion formed on the inner periphery of the housing, key and key way means disposed between the actuating rod and the sleeve for preventing relative rotation between the sleeve and the actuating rod but allowing relative sliding movement therebetween, whereby manual rotation of said actuating rod effects rotation and axial adjustment of said sleeve and of said actuating rod, locking means for releasably preventing the rotation of the sleeve relative to the housing, an elongated transparent window formed in the housing and extending in the direction of the axis thereof, a scale disposed in the window, and a datum line formed around the outer periphery of the sleeve and visible through said window.

4,141,252

FLUSH PRESSURE TRANSDUCERS FOR MEASURING PRESSURES IN A FLOWING FLUID

Arthur S. Lodge, 210 DuRose Terrace, Madison, Wis. 53705

Filed Nov. 4, 1977, Ser. No. 848,516
Int. Cl.[2] G01L *9/12*
U.S. Cl. 73—724 **14 Claims**



1. A flush pressure transducer, comprising

diaphragm means having a substantially flat surface,

a body backing up and supporting said diaphragm means, said body having an opening therein,

said diaphragm means covering said opening and affording a flexible resilient diaphragm across said opening,

sensor means operable by said diaphragm for sensing any deflection of said diaphragm due to any pressure differential between the opposite sides of said diaphragm,

said sensor means including a first capacitor electrode spaced from said diaphragm,

said diaphragm including a second capacitor electrode, said first and second capacitor electrodes affording a variable capacitance which is variable by deflection of said diaphragm,

and fluid pressure applying means for applying fluid pressure to said diaphragm within said opening to counterbalance an applied pressure on the opposite side of said diaphragm.

4,141,253

FORCE TRANSDUCING CANTILEVER BEAM AND PRESSURE TRANSDUCER INCORPORATING IT

Robert C. Whitehead, Jr., Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 672,263, Mar. 31, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,426
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—727 **28 Claims**

1. A pressure transducer with minimized hysteresis, comprising

a semiconductor beam having a stress sensitive portion,

a diaphragm formed of a material having an internal viscosity which at least closely approaches that of said beam,

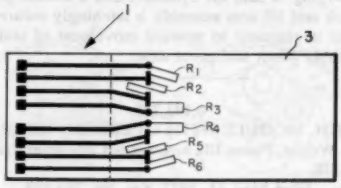
supporting means for supporting said diaphragm at one portion thereof,

pressurizing means for causing a fluid pressure to act on one surface of a deflecting portion of said diaphragm to cause the last mentioned portion to deflect with respect to said one portion by an amount dependent upon said pressure,

mounting means for mounting one end of said beam on said

supporting means to cantilever said beam from said supporting means,

connecting means for connecting the other end of said beam to said deflecting portion of said diaphragm to cause said other end to be deflected by deflection of said deflecting portion,



said mounting means and said connecting means being constructed and arranged to preserve the unitary internal viscosity of said beam and said diaphragm within said transducer to minimize the hysteresis exhibited thereby, and

a semiconductor strain gauge diffused into the surface of said stress sensitive portion to sense the strain produced therein by the deflection of said other end of said beam.

4,141,254

PUSHBUTTON RESELECTION TUNER WITH PIVOTING LEVER

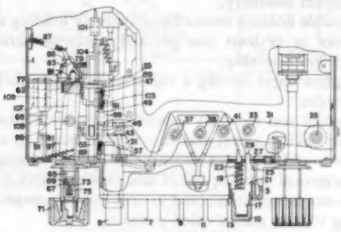
Geert Spakman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,878

Claims priority, application Netherlands, May 13, 1976, 7605095

Int. Cl.[2] F16H *35/18*

U.S. Cl. 74—10.33 **9 Claims**



7. A pushbutton preselection tuning mechanism, comprising a frame, a plurality of pushbutton rods journalled in the frame for sliding movement in a given direction parallel to each other, each rod corresponding to a preselected station; a lever disposed in a plane parallel to the direction of movement of the pushbutton rods, and pivotally connected to the frame for movement about a fixed axis against a spring force; means for pivoting said lever to a given position corresponding to the preselected station upon depression of a pushbutton rod; tuning means; and means for coupling the tuning means to the lever for sliding movement parallel to said given direction, wherein the improvement comprises:

a slide mounted to the frame for movement parallel to said given direction and coupled to the lever near a free end of the lever, having at least one tooth projecting in a direction transverse to said given direction,

a continuous adjustment drive for the tuning means, comprising a shaft rotatable about a longitudinal axis, having a helical tooth about the shaft circumference facing said at least one tooth, and pivotally mounted to the frame about an axis adjacent a first end of the shaft transverse to the longitudinal axis and remote from said helical tooth; a first spring arranged to bias the shaft first end in a direction parallel to said given direction toward the helical tooth, a member having bearing means for positioning the second end of the shaft and arranged for movement of the bearing means transverse to said given direction, and a second spring for biasing said member in a transverse direction so as to urge the helical tooth toward said at least one tooth, and

means for disconnecting the slide from said continuous adjustment drive, responsive to depression of a pushbutton rod, comprising a latch arranged to be engaged by said pushbutton rods for sliding movement in a releasing direction transverse to said given direction in response to depression of one of said push-button rods, and means for coupling the latch to the shaft to pivot the helical tooth out of engagement,

and the means for coupling the tuning means to the lever comprise means connecting the tuning means to the slide.

4,141,255

MECHANISM FOR TRANSFERRING A ROTARY MOTION INTO AN AXIAL MOTION

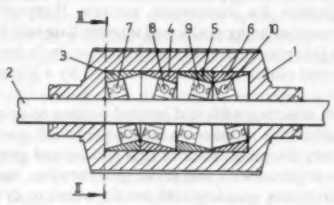
Sven W. Nilsson, Partille, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Mar. 29, 1977, Ser. No. 782,561

Claims priority, application Sweden, May 14, 1976, 7605491

Int. Cl.[2] F16H *21/16*

U.S. Cl. 74—25 **9 Claims**



1. A mechanism for transferring a rotary motion into an axial motion comprising a shaft (2) having a smooth, cylindrical envelope surface, a retainer (1) enclosing the shaft and being rotatable relative thereto, a plurality of bearing housings (3, 4, 5, 6) with bearing seats inclined towards the shaft being arranged in the retainer, bearings (7, 8, 9, 10) having outer and inner race rings being arranged in said bearing seats, the bore diameter of said inner race rings, which are arranged to enclose the shaft, being larger than the diameter of the shaft, characterized thereby, that the bearing seats are designed completely to enclose the outer race rings of the bearings, and including a recess in said retainer having opposing sidewalls defining guide surfaces, said bearing housings slidable in and guided by said sidewalls for displacement substantially perpendicularly to the shaft, said bearing housings being subjected to a force in the direction of displacement so as to urge the inner race rings of the bearings against the envelope surface of the shaft.

4,141,256

TWO-SPEED INERTIA MOTOR

Nicol S. Wilson, Redondo Beach; Gary L. Hunter, Huntington Beach, and Derek J. Gay, Rancho Palos Verdes, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 17, 1977, Ser. No. 764,221

Int. Cl.[2] F16H *32/02*

U.S. Cl. 74—64 **9 Claims**

1. In a power module for driving a toy vehicle or the like, the combination comprising:

a supporting structure;

a first axle supported by said structure and having at least

one drive wheel affixed thereto, said drive wheel having a coaxial drive gear member coacting therewith;

a second axle mounted within said structure;

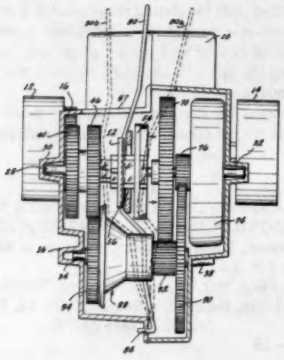
an inertia wheel rotatably mounted on said second axle;

a main gear member rotatably mounted on said second axle and having a gear portion and a splined shaft portion, said gear portion meshingly engaging said drive gear member;

a first gear member rotatably mounted on said second axle;

a second gear member mounted on said splined shaft portion and rotatable relative thereto;

a clutch member axially slidably mounted on said splined



shaft portion for concurrent rotation therewith, said clutch member being positioned intermediate said first and second gear members, said clutch member including a first and second clutch discs interconnected by a journal portion;

a shift fork coacting with said journal portion to selectively slide said clutch member on said splined shaft portion for selectively coupling either of first and second gear members for rotation with said drive gear member; and

other gear means coupling said inertia wheel to drive said drive gear member through said so-selected first and second gear members.

4,141,257

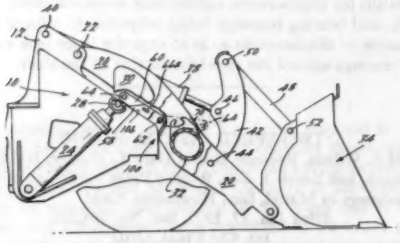
SAFETY LATCH FOR TRACTOR LOADER

Howard A. Hammond, Alexander, and John F. Sardina, Williamsville, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1977, Ser. No. 829,118

Int. Cl.[2] G05G *5/06;* **B66F** *9/00;* **E02F** *3/00*

U.S. Cl. 74—529 **15 Claims**



1. A safety latch mechanism for use with a tractor loader of the type including a loader frame; a lift arm assembly including a pair of lift arms pivotally mounted adjacent their rearward ends to opposite sides of said frame; a pair of lift cylinders for pivoting said lift arm assembly; and a bucket pivotally mounted to the forward ends of said lift arms; said safety mechanism including:

A. coacting latch means carried by said lift arm assembly and said frame, respectively, and including a latching member moveable between a first position in which said lift arm assembly is free to move about its pivot axis under the urging of said lift cylinders and a second position in which said lift arm assembly is latchingly secured to said frame in response to upward movement of said lift arm assembly about said pivot axis.

4,141,258

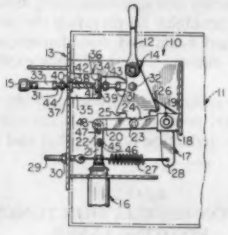
CONTROL MODULE WITH OVERRIDE MECHANISM

James L. Walzer, Plano, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 31, 1977, Ser. No. 783,103

Int. Cl.[2] G05G *5/06*

U.S. Cl. 74—540 **10 Claims**



1. A control module adapted for mounting on a vehicle comprising

a bracket assembly adapted for attachment to a support structure of said vehicle,

a control lever,

pivot means pivotally mounting said control lever on said bracket assembly,

releasable holding means for selectively holding said control lever in at least one pivoted position thereof on said bracket assembly,

a control valve having a valve spool reciprocally mounted therein,

a control rod movably mounted on said bracket assembly and having a first end thereof connected to said control lever and having a second end thereof connected to the reciprocal valve spool of said control valve,

kick-out means connected to said holding means for releasing it from said pivoted position,

lost-motion means interconnected between said kick-out means and said holding means for selectively permitting release of said holding means while simultaneously overriding said kick-out means upon movement of said control lever to permit said control lever to actuate said control rod, independent of said kick-out means, and

a support structure and wherein said bracket assembly is detachably mounted on said support structure.

4,141,259

SEQUENCING DEVICE UTILIZING PLANETARY GEAR SET

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Walter T. Appleberry, Long Beach, Calif.

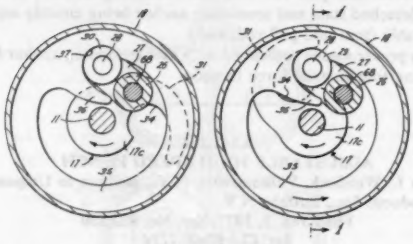
Filed Feb. 25, 1977, Ser. No. 772,168

Int. Cl.[2] F16H *37/06*

U.S. Cl. 74—674 **14 Claims**

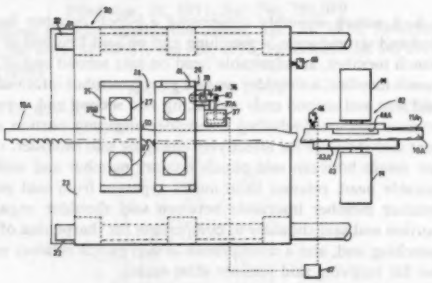
1. A sequencing device comprising an epicyclic gear train having a housing, a sun gear, a ring gear member, a plane carrier member, and planet gears on said carrier member meshing with said sun gear and said ring gear member, a pair of

latch elements pivotally carried by said housing, a pair of output members actuable, respectively, with said ring gear and said carrier members, and latching notches for said elements, respectively, in said ring gear and said carrier members, and latch element actuators movable, respectively, with said ring



gear and carrier member, and, respectively, substantially coplanar with different ones of said latch elements and positioned relative thereto to sequentially shift said latch elements into and out of the corresponding latch notches and, thereby, sequentially stop and start said ring gear and carrier members and said output members.

4,141,260
APPARATUS FOR MAKING SAW BLADES
Millo Bertini, 679 Garden St., Trumbull, Conn. 06611
Filed Dec. 23, 1976, Ser. No. 753,733
Int. Cl.[2] B23D *65/00*
U.S. Cl. 76—25 R **16 Claims**



1. An apparatus for making saw blades having serially connected stepped cutting segments wherein the cutting teeth in each segment are progressively sloped relative to the back edge of the saw blade so that a transverse section through each said segment progressively increases from the leading to trailing edge of each such segment comprising:

a moveable carriage for movement between an operative and inoperative position,

clamping means mounted on said carriage for gripping a saw blade,

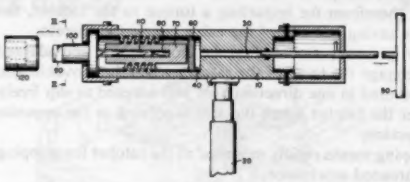
actuating means for actuating said clamping means to grip the saw blade,

said clamping means including means for heating a portion of the saw blade clamped thereby in the clamped position,

means for actuating said clamping means to effect a lateral offset in the blade,

and means spaced from said clamping means in the direction of travel of said moveable carriage toward the operative position thereof for shearing the back edge of blade as said carriage is moved toward operative position to define a back edge which is coincidental to each segment of said blade whereby the cutting teeth of the respective segments are progressively sloped relative to the back edge.

4,141,261
HYDRAULIC WRENCH
Harold Tummel, South Path, St. James, N.Y. 11780
Filed Feb. 28, 1977, Ser. No. 772,920
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.11 **1 Claim**



1. A hydraulic wrench, comprising:

a housing;

a first axially extending cylindrical opening in the housing;

a manually operable plunger in the first cylindrical opening which is movable axially back and forth therein;

a second axially extending cylindrical opening in the housing communicating with the first cylindrical opening and having a larger cross-sectional area than the first cylindrical opening;

a piston in the second cylindrical opening movable axially back and forth therein;

hydraulic fluid filling the cylindrical openings between the piston and the plunger, so as to form a force-multiplying hydraulic system which causes a given force applied for a given distance at the plunger to appear as a larger force applied for a smaller distance at the piston;

a radially outwardly extending handle which fixes secure the housing;

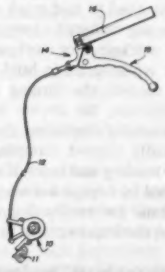
an axially extending shaft rotatably mounted in the housing and protruding forwardly therefrom;

an elongated, axially extending worm gear threadedly engaging the housing and located directly forwardly of the piston so as to be pushed axially forwardly thereby when the piston moves forward, the worm gear having an hexagonal bore extending axially rearwardly from the front of the gear;

an elongated hexagonal rod extending axially rearwardly from the rear end of the shaft and being located in the bore of the worm gear; and

means for detachably securing a socket to the forward end of the shaft.

4,141,262
REMOTE OPERATED WRENCH
Clyde D. Smith, 609 Rorary, Richardson, Tex. 75081
Filed May 6, 1977, Ser. No. 794,453
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—57.39 **9 Claims**



1. A remote operated wrench comprising:

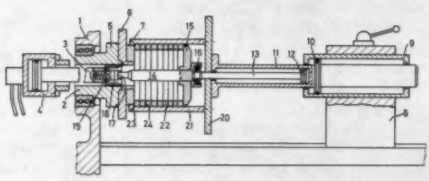
a flexible cable housing;
a flexible cable reciprocatingly carried within the housing;
a wrench housing having a guide extending therefrom, the guide receiving one end of the cable housing and permitting the cable to pass freely therethrough;
a ratchet rotatably mounted in the housing;
a movable arm pivotally mounted in the housing and extending therefrom for imparting a torque to the ratchet, the arm having one end of the cable connected thereto;
a pawl pivotally mounted on the movable arm and adapted to engage the teeth of the ratchet when the movable arm is pivoted in one direction only and adapted to slip freely over the ratchet when the arm is rotated in the opposite direction;
a gripping means rigidly mounted to the ratchet for gripping a threaded workpiece;
a restraining means for preventing movement of the housing when the gripping means is rotated; and
a control means for retracting the cable in the cable housing to impart a torque to the arm.

4,141,263

DEVICE FOR THE CENTERED CLAMPING OF ANNULAR WORKPIECES

Hermann Leutgäb, Derching, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,520
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633433
Int. Cl.[2] B23B *31/30*
U.S. Cl. 82—45 **17 Claims**



1. In a device for the centered clamping, in a turning machine, of an annular workpiece or workpiece stack formed of a plurality of annular workpieces, to hold the same in position for the machining thereof; the turning machine including a hollow work spindle; the device including a centering cylinder; means for axially displacing the centering cylinder; first and second axially aligned clamping discs for engaging opposite, radially extending end faces of a workpiece or workpiece stack positioned in a space between the clamping discs; and a clamping means for axially urging the two clamping discs to one another; the clamping means including a tensioning anchor extending within the work spindle; the improvement comprising releasable means for detachably connecting said tensioning anchor to said work spindle; said first clamping disc being secured to said tensioning anchor and said second clamping disc being fixedly attached to said work spindle.

7. In a device for the centered clamping, in a turning machine, of an annular workpiece or workpiece stack formed of a plurality of annular workpieces, to hold the same in position for the machining thereof; the turning machine including a headstock and a tailstock; the device including a centering cylinder; means for axially displacing the centering cylinder; first and second axially aligned clamping discs for engaging opposite, radially extending end faces of a workpiece of workpiece stack positioned in a space between the clamping discs; and a clamping means for axially urging the two clamping discs to one another; the improvement in said clamping means comprising

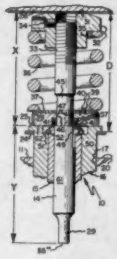
a. a pull rod supported in said headstock;
b. a tensioning anchor carrying said first clamping disc and being supported in said tailstock in axial alignment with said pull rod;
c. releasable means for detachably interconnecting said pull rod with said tensioning anchor; in the interconnected state of said pull rod and said tensioning anchor said releasable means transmitting axial tensioning forces between said pull rod and said tensioning anchor; in the detached state said tensioning anchor being entirely separable from said pull rod; and
d. a power means connected with said tensioning anchor for exerting an axial force thereon.

4,141,264

ADJUSTABLE HIGH SPEED PUNCH

Ralph L. Weisbeck, Williamsville, N.Y., assignor to Unipunch Products, Inc., Buffalo, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,820
Int. Cl.[2] B26F *1/14*
U.S. Cl. 83—23 **13 Claims**



1. A punch assembly comprising a punch member having first and second ends, a punching end on said first end of said punch member, an adjustable head on said second end of said punch member, a shoulder on said punch member intermediate said first and second ends and facing said second end, a punch retainer member including a shoulder engaging portion adjacent said shoulder for effectively engaging said shoulder, stripper means between said punch retainer member and said adjustable head, retainer shim means separate from said punch retainer member insertable between said shoulder engaging portion and said shoulder to compensate for sharpening of said punching end, and a counterbore in said punch retainer member for receving said retainer shim means.

4,141,265

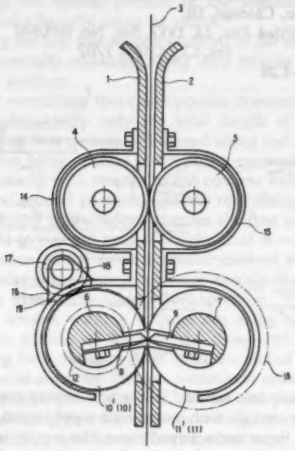
CLEANING AND LUBRICATING FOIL CUTTER

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Mar. 25, 1977, Ser. No. 781,523
Claims priority, application Italy, Mar. 31, 1976, 3390 A/76
Int. Cl.[2] B26D *7/08, 1/40*
U.S. Cl. 83—169 **2 Claims**

1. A device for cutting a roll of foil having a given width and made at least partially of metal into lengths in a packet cigarette packer, the device comprising one or more couples of continuous feed wheels for effecting feed of the foil from said roll along a given path and between fixed guides, a first cutting blade and a second cutting blade having respective cutting edges positioned substantially perpendicularly to said path for severing the foil along its width perpendicular to said path, said first and second blades being counter positioned on the down side of said feed wheels of which at least said first cutting blade possesses continuous rotary movement round an axis parallel to the same feed wheels, and a cylindrical pad of absorbent material supported freely turning round its own axis placed

parallel in position such that during its rotating movement the cutting edge of said first cutting blade comes into contact with



said cylindrical pad of absorbent material presoaked in lubricant.

4,141,266

DRUM TYPE FLYING SHEARS

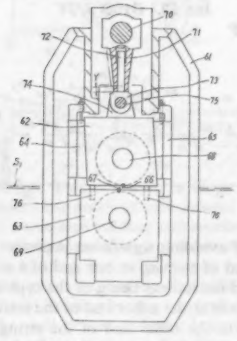
Tsutomu Hara, and Bunpei Masuda, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Apr. 26, 1977, Ser. No. 791,049

Claims priority, application Japan, Apr. 28, 1976, 51-49586; Apr. 28, 1976, 51-49587; Apr. 28, 1976, 51-49589; Sep. 14, 1976, 51-110182

Int. Cl.[2] B23D *25/12*

U.S. Cl. 83—337 **1 Claim**



1. In a drum type flying shear an improvement comprising guide means at each side of the flying shear for permitting the downward and upward movement of at least one of an upper bearing box carrying an upper drum having an upper blade and a lower bearing box carrying a lower drum having a lower blade and means for causing the downward and upward movement of either said upper bearing box or lower bearing box and wherein one end of a first connecting rod is attached to the throw or crankpin of a crankshaft, and a second connecting rod whose lower end is pivoted to said upper or lower bearing box is slidably fitted into an axial hole extended from the other end of said first connecting rod.

4,141,267

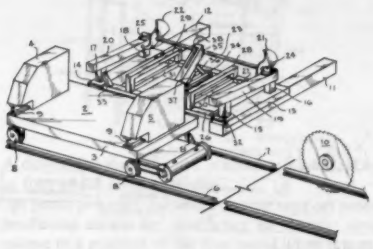
SAWMILL METHOD AND APPARATUS

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Division of Ser. No. 746,519, Dec. 1, 1976, which is a division of Ser. No. 470,338, May 16, 1974, Pat. No. 4,094,220. This application Jul. 20, 1977, Ser. No. 817,230

Int. Cl.[2] B27B *31/02, 31/04*

U.S. Cl. 83—712 **8 Claims**



1. An improved stop and loader assembly for use in a sawmill having a rotatable saw blade and the like, and further having a carriage movable to and from said saw blade, comprising

a rotatable shaft aligned with and spaced laterally from said carriage,

a pair of stop and loader members mounted in a spaced-apart manner on said shaft and formed to receive and support a sawlog and the like,

a plurality of spaced-apart rail members supporting said shaft and extending perpendicularly between and tilting upward from said shaft to said carriage,

a pair of spaced-apart support members aligned beside said carriage in an end-to-end relationship to each other,

a tubular member having a sidewall aperture adjacent one end rotatable generally arcuately in a vertical plane perpendicular to said shaft about a pivot point aligned with said saw blade and located generally between the adjacent ends of said spaced-apart support members,

first actuating means for rotating said tubular member between a substantially erect position wherein said tubular member is disposed between said support members and said sidewall aperture therein confronts said carriage and a generally reclining position lower than any sawlog supported on said stop and loader members,

log turning means movable longitudinally in said tubular means and having a log engaging portion extendable outwardly through said sidewall aperture and retractable within said tubular means, and

second actuator means for moving said log turning means in said tubular means.

4,141,268

KEYBOARD APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Toshio Kugisawa, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jun. 30, 1977, Ser. No. 811,639

Claims priority, application Japan, Jul. 2, 1976, 51-78647

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.03 **9 Claims**

1. Keyboard apparatus for an electronic musical instrument comprising:

a keyboard of the electronic musical instrument, keys of the keyboard being each assigned a particular code;

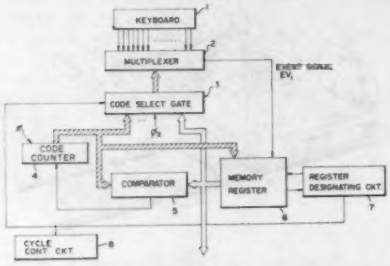
a multiplexer circuit for detecting the depression of the key corresponding to an input code and providing an output signal indicative of such depression;

means for sequentially generating codes of the keys;

memory means responsive to the output signal from said multiplexer circuit for storing the codes;

a cycle control circuit for controlling a key ON cycle and a key OFF cycle in distinction from each other;

a comparator circuit operative only during the key ON cycle for comparing the output from the memory means with the output from the code generating means to generate a coincidence signal only when the both outputs are coincident with each other; and



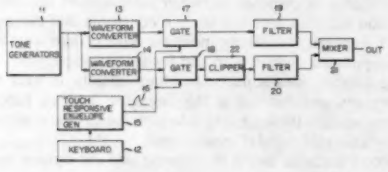
gate means operative in the key ON cycle and responsive to the absence of said coincidence signal for selecting the output code from the code generating means and applying it as the input code to said multiplexer circuit, and operative in the key OFF cycle for selecting the codes stored in said memory means and applying it as the input code to said multiplexer circuit.

4,141,269

ELECTRONIC MUSICAL INSTRUMENT

Kenji Itakura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 28, 1977, Ser. No. 772,597
Claims priority, application Japan, Mar. 5, 1976, 51-26132[U]
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.22 **16 Claims**



1. An electronic musical instrument comprising:

a keyboard having a plurality of keys;

means for providing a plurality of tone signals corresponding to one note, each of the tone signals having a common fundamental frequency and different frequency spectra;

means coupled to said keyboard and arranged to generate an envelope signal in response to a key depression, the envelope signal having an amplitude which is a function of the key depression speed;

a plurality of envelope imparting means, each being connected to receive the envelope signal and one of the tone signals, and being arranged to impart the envelope of the envelope signal to the applied tone signal;

mixing means for mixing the output signals of said plurality of envelope imparting means; and

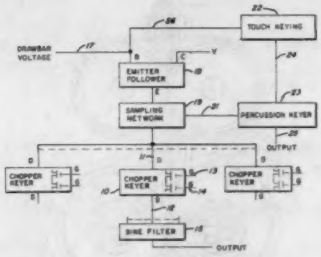
clipping means connected between the output of at least one of said envelope imparting means and said mixing means to clip the output of said envelope imparting means.

4,141,270

MODULATED KEYER SUPPLY SAMPLING CIRCUIT

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Jun. 23, 1977, Ser. No. 809,503
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **4 Claims**



1. In an electronic musical instrument keying system having several keyer circuits each including a supply input, an output, a modulated input and a keyed input, the supply inputs being grouped according to particular harmonics of played notes with each such group of supply inputs being coupled from a common source and the outputs not being so grouped, the improvement comprising:

(a) sampling means coupled to a said common source for sampling modulation of its associated supply inputs and having an output; and

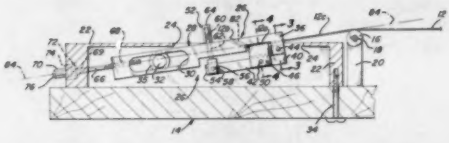
(b) waveshaping means coupled from the output of the sampling means for producing desired audio output waveforms.

4,141,271

METHOD AND APPARATUS FOR PREVENTING IMPROPER STRING RETURN

Delmar E. Mullen, 7061 Newport St., Commerce City, Colo. 80022

Filed Sep. 1, 1976, Ser. No. 719,379
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—312 P **7 Claims**



1. A method of avoiding significant improper string return by securing an end of a string to one end of a stringed instrument, the stringed instrument being of the type including tension changing means at the other end of the instrument operatively connected to the other end of the string for effecting selected and repeated increases and decreases in string tension from a predetermined normal string tension level during playing of the instrument, said inventive method comprising the steps of:

selecting an end of the string opposite the end of the string connected to the tension changing means, said selected end of the string being essentially of uniform diameter therealong and free of any significant external protuberances extending therefrom;

apportioning the selected end of the string into an outermost first portion and a next inwardly adjacent second portion, the first and second portions of the string and each having a selected elongated length;

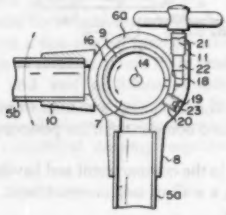
extending the first portion of the selected string end essentially linearly along its length;
extending the second portion of the selected string end essentially linearly along its length;
extending the first and second portions of the selected string end essentially colinearly along their lengths with respect to one another;
applying restraining force on opposite transverse sides and over substantially only the total length of the linearly extending first portion of selected string end, the restraining force being applied to the string essentially only perpendicularly with respect to the colinear extension of the first and second portions, and the restraining force being of sufficient magnitude of restrain the first portion of the selected string end against longitudinal movement under application of the predetermined level of string tension and under the selective increases and decreases in string tension from the predetermined level;
applying tension creating force in the string operatively at the first portion of the selected string end, the tension creating force being applied from the end of the stringed instrument at a point thereon operatively colinearly with a linear projection of the first and second portions of the selected string end, the tension creating force determining the predetermined level of string tension;
repeatedly selectively changing the tension of the string from the predetermined level; and
allowing the string tension to return to the predetermined level after each tension change.

4,141,272

TOM-TOM HOLDER

Mitsuo Yanagisawa, Yachiyo, Japan, assignor to Pearl Musical Instrument Co., Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,827
Claims priority, application Japan, Jan. 25, 1977, 52-7637
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—421 **1 Claim**



1. In a tom-tom holder having a hinge joint connecting between a support bar received and secured in a bracket on a bass drum and a tom-tom holding arm received and secured in a bracket on a tom-tom in such a manner that the angular position of said holding arm with respect to said support bar can be adjusted, characterized by that said hinge joint comprises a cylindrical housing having a cylinder bore therein and a socket on the wall of said cylinder bore for receiving said support bar, a bushing having a disk from the inner side of which an annular projection extends and a socket on the outer side of said disk for receiving said tom-tom holding arm, an aligning bolt and locking ring unit for holding said housing and bushing in co-axial relationship and allowing the bushing to rotate relative to the housing, resilient band interposed between the inner periphery of said cylinder bore and the outer periphery of said annular projection on the bushing and having one end secured in the housing cylinder bore and a band fastening screw threaded in a threaded bore tangential to the housing cylinder bore and communicating between the outer side of said housing and the interior of the cylinder bore, said band fastening screw being adapted to bias the other end of said resilient band.

4,141,273

MUSIC LEARNING AID

Benjamin Austin, 1567 Mistletoe Dr., Cleveland, Ohio 44106

Filed Jan. 16, 1978, Ser. No. 869,689
Int. Cl.[2] G04F *5/02*
U.S. Cl. 84—484 **12 Claims**

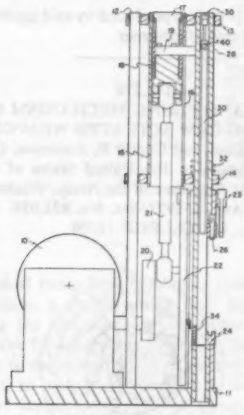
1. A device for learning and practicing a musical beat comprising foot pedal support means,
a foot pedal pivotally mounted on said support means, signal producing means for producing an electric signal in response to a position of the foot pedal when it is at a downward position, and another electric signal in response to a position of the foot pedal when it is at an upward position,
a visual readout means for producing a visual signal in response to said first mentioned electric signal, and
another visual signal in response to said other electric signal.

4,141,274

WEATHER MODIFICATION AUTOMATIC CARTRIDGE DISPENSER

Robert L. Gerber, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 14, 1977, Ser. No. 842,448
Int. Cl.[2] B64D *1/04*
U.S. Cl. 89—1.5 R **12 Claims**



1. A cartridge dispenser comprising;
a base member for supporting the dispenser;
motive means mounted on the base member;
support means secured to said base member;
cylinder like means supported by said support means;
piston like means slideably mounted in said cylinder like means and reciprocable therein;
barrel means secured to said support means;
cartridge ejector means slideably mounted within said barrel means and reciprocable therein;
cocking means carried by said piston-like member and engageable with a portion of said cartridge ejector means;

connecting rod means linking said motive means and said piston-like member;

said motive means being operable to move said cartridge ejector means to a cocked position; and

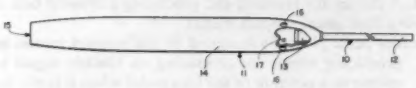
trigger means operable to release said cartridge ejector means from the cocked position.

4,141,275

AFTERBURNER RECOILLESS RIFLE

Guilford L. Hollingsworth, China Lake, and Alexander C. Charters, Santa Barbara, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1977, Ser. No. 815,736
Int. Cl.[2] F41F *3/02*
U.S. Cl. 89—1.703 **2 Claims**



2. In a method for firing a recoilless rifle wherein rearwardly directed gas from the recoilless rifle is utilized to produce counter recoil action, the improvement residing in:

a. affixing an afterburner having an open forward end, a combustion chamber with air inlets to allow air to enter and an aft end to said recoilless rifle in a position such that the barrel of said recoilless rifle passes through said open forward end and the breech of said recoilless rifle is behind said open forward end;

b. allowing oxygen containing air to enter said combustion chamber through said air inlets;

c. allowing said rearwardly directed gas to mix with said air in said combustion chamber;

d. igniting the mixture of air and rearwardly directed gas; and

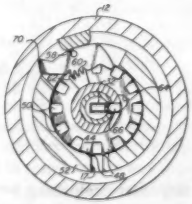
e. exhausting the products produced by said ignition through said aft end of said afterburner.

4,141,276

LOCKING AND FIRING MECHANISM FOR ROTATING-CAM ACTUATED WEAPONS

David C. Taylor, Milan, and Gerald R. Anderson, Coal Valley, both of Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1977, Ser. No. 821,016
Int. Cl.[2] F41F *11/06*
U.S. Cl. 89—11 **5 Claims**



1. A locking and firing mechanism for rotating-cam actuated weapons comprising:

a chamber longitudinally moveable between forward in-battery and rear recoil positions, said chamber having an actuating stud thereon,

said weapon having a rotating drum with a helical cam path thereon engageable with said stud whereby rotation of said drum causes longitudinal movement of said chamber,

locking means for locking said chamber in in-battery position including a locking ring rotatably mounted on said chamber,

said weapon having a receiver with longitudinal grooves therein,

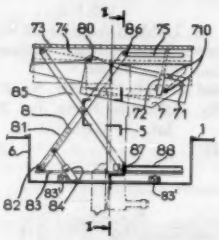
said locking ring having teeth thereon engageable with said grooves when said locking ring is rotated in one direction to unlocked position and out of engagement therewith when said locking ring is rotated in the opposite direction to locked position, said locking and firing mechanism including actuator means operable by said rotating drum for rotating said locking ring at preselected angles of rotation of said drum.

4,141,277

INSTALLATION FOR LAUNCHING MISSILES

Jean Bouillon, Coye la Foret, France, assignor to Creusot-Loire, Paris, France

Filed Jul. 5, 1977, Ser. No. 812,594
Claims priority, application France, Feb. 11, 1977, 77 03997
Int. Cl.[2] F41F *23/02*
U.S. Cl. 89—38 **3 Claims**



1. An installation for launching a missile from an armored vehicle having a closed compartment for personnel, the installation comprising:

a housing located in the compartment and having an opening which opens in a wall of said compartment;

a launching ramp;

lifting means for moving said launching ramp through said opening between a firing position outside said housing and a retracted position in which said launching ramp and lifting means are within said housing;

means for controlling movement of said lifting means;

a closure for the opening of said housing which is in closed position when said launching ramp is in its retracted position, said closure in said closed position being substantially in extension of said wall of said compartment;

a periscopic sighting device arranged to be extendable through said wall of said compartment;

said housing extending about said periscopic sighting device;

support means in said housing for said lifting means; and

means mounting said support means for rotation within said housing about said sighting device for rotating said ramp about said sighting device at least in said elevated firing position;

said lifting means comprising two arms arranged about said sighting device and articulated about a horizontal axis on said rotatable support means, said rotatable support means being movable on rolling bodies in a circular path surrounding said sighting device.

4,141,278

POLYGONAL TURNING MACHINE

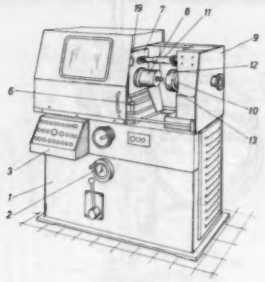
Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Werner, Wuppertal

Filed Jul. 8, 1976, Ser. No. 704,117

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553216

Int. Cl.[2] B23C *1/00, 3/13*

U.S. Cl. 90—11 R 9 Claims



1. A combination polygonal and cylindrical turning machine, comprising

a rotatable knife head defining an axis of rotation,

cutter means for a polygonal turning mounted on said knife head,

additional cutter means for a cylindrical turning mounted on said knife head,

a support,

a workpiece carrier adapted to hold a workpiece and rotatably mounted on said support, said workpiece carrier defining a workpiece carrier-axis,

means for rotating said workpiece carrier synchronously to said knife head,

guide means for selectively bringing said workpiece carrier-axis from a non-coaxial position into a coaxial position to said axis of rotation of said knife head such that said cutter means and said additional cutter means operatively project onto the workpiece held by said workpiece carrier, respectively, to perform thereon a polygonal turning and a cylindrical turning, respectively, in each of said positions.

4,141,279

METHOD AND APPARATUS FOR CUTTING CIRCUMFERENTIAL GROOVES ON THE INTERIOR OF A WORKPIECE

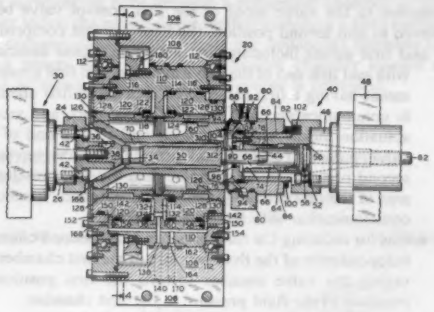
Eugene K. Abel, York, and Jack K. Shupp, East Berlin, both of Pa., assignors to Flinchbaugh Products, Inc., Red Lion, Pa.

Filed Dec. 9, 1977, Ser. No. 859,173

Int. Cl.[2] B23C *3/34*

U.S. Cl. 90—11 C 13 Claims

1. The method of forming at least one groove in a hollow workpiece having a circular inner wall, comprising inserting into the workpiece, an elongated cutting tool having a cutter portion intermediate the ends thereof, said cutter portion having a maximum diameter less than the inside diameter of the workpiece, supporting both ends of said cutting tool and supporting the workpiece for rotation about their respective axes, rotating said tool in one direction and the workpiece in the opposite direction so as to provide relative rotational movement between them; and effecting relative movement between said tool and the workpiece in a direction transverse to the axis



of the tool to engage the cutting portion with said inner wall and to cut the groove therein.

4,141,280

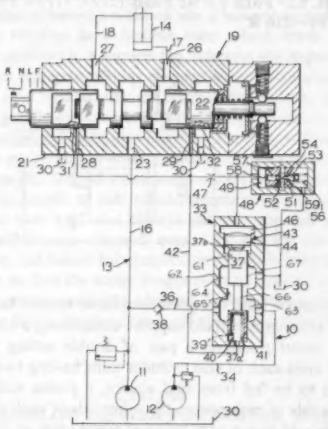
DUAL PUMP FLOW COMBINING SYSTEM

Larry W. Lorimor, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,259

Int. Cl.[2] F15B *13/04*

U.S. Cl. 91—29 6 Claims



1. In a dual pump flow combining system having first and second pumps; a double acting fluid motor; a fluid circuit connecting the first pump to the motor and having a first control valve for controlling fluid flow therethrough from the first pump to the motor, said first control valve having a first signal port, an inlet port connected to the first pump, a first motor port connected to the first pump, a first motor port connected to the motor, and a valve spool movable between a first position at which the inlet port is blocked from communication with the first motor port and the first signal port, and a second position at which substantially the total output of the first pump passes through the first control valve from the inlet port to the first motor port and the first motor port is in communication with the first signal port; and valve means connected to said second pump and to said fluid circuit, said valve means having a valve member having first and second ends and being movable between a first position at which the second pump is in communication with a tank and a second position at which the second pump is blocked from communication with the tank and the output of the second pump is combined with

the output of the first pump in the fluid circuit, biasing means for urging the valve member to the first position, and first means for moving the valve member to the second position in response to the valve spool of the first control valve being moved to said second position; the improvement comprising:

said first means including first actuation means associated with said first end of the valve member, said first actuation means having a first preselected area and a first chamber in communication with the first signal port; and second actuation means associated with said second end of the valve member, said second actuation means having a second preselected area greater than the first preselected area of the first actuating means, and a second chamber in communication with the signal port; and

means for reducing the fluid pressure in the second chamber independently of the fluid pressure in the first chamber for urging the valve member toward the first position in response to the fluid pressure in the first chamber.

4,141,281

PRESSURE FLUID OPERATED FEED DRIVE SYSTEM FOR A MOVABLE MEMBER

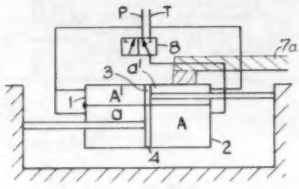
Julius Harman, Baginton, and Michael E. Norman, Jesmond, both of England, assignors to Alfred Herbert Limited, Coventry, England

Filed Jun. 28, 1976, Ser. No. 700,203

Claims priority, application United Kingdom, Jul. 9, 1975, 28827/75

Int. Cl.[2] F01B *15/00;* **F15B** *15/17, 11/16, 13/06*

U.S. Cl. 91—216 R **5 Claims**



1. A pressure fluid operated feed drive system for moving a member relative to a fixed support comprising a single source of fluid under pressure, a pair of double acting piston and cylinder units each of said cylinder units having two chambers arranged to be fed from said source, a piston rod extending from one side of each piston, the other side of each piston being a full side said piston rods being of equal cross section and the piston rod of one unit extending in a direction opposite to the direction of the piston rod of the other unit, said respective pairs of piston rods and cylinders being rigidly interconnected, one of said rigidly interconnected piston rod pairs and cylinder pairs being connected to the movable member and the other of said interconnected piston pairs and cylinder pairs being connected to said fixed support, and valve means operable so that a first effective piston area is obtained by connecting the chambers on opposite sides of one piston to the source and connecting the chambers on opposite sides of the other piston in series between the source and a receiving tank, and a second effective area is obtained by connecting the full side of the other piston and the rod side of the one piston the source and the full side of one piston and the rod side of the other piston to tank to permit pressure fluid to be simultaneously supplied and withdrawn from the cylinder chambers in a regenerative system selectively to and from the units such as to provide a differential pressure on said pistons that the member may be moved alternatively under the action of a force derived from differing piston areas.

4,141,282

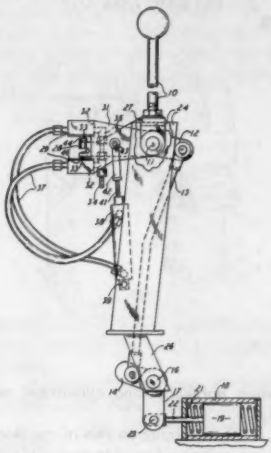
LEVER WITH POWERED ACCESSORY

Herman J. Maurer, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed May 9, 1977, Ser. No. 795,124

Int. Cl.[2] F15B *9/10, 13/10*

U.S. Cl. 91—374 **1 Claim**



1. A lever with an air-powered accessory for forcing against a resistance, comprising a support member, a pivot pin on said support member, a lever pivotally mounted on said pivot pin and adapted for manual initial manipulation and being movable in two opposite directions, a member pivotally mounted on said pivot pin and disposed adjacent said lever, said member having two portions disposed on opposite sides of said lever to be contacted thereby in the respective paths of said two directions of movement of said lever and being in a lost motion relation with said lever whereby pivoting of said lever also pivots said member, an air-powered cylinder assembly attached to said member and being extendable and contractible for pivoting said member when said air-powered cylinder assembly is energized, a pressurized air connection connected with said air-powered cylinder assembly, two air valves operatively connected with said air connection and said air-powered cylinder assembly for releasing pressurized air to said air-powered cylinder assembly, said air valves being mounted spaced apart on said member on the respective two portions thereof to be respectively disposed in the two paths of movement of said lever in said lost motion relation with said lever and being operated in response to said manipulation of said lever for energizing said air-powered cylinder assembly and apply it against the resistance.

4,141,283

PUMP UNLOADING VALVE FOR USE IN AGRICULTURAL TRACTOR LIFT SYSTEMS

William C. Swanson, Clarendon Hills, and Imre Galos, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 1, 1977, Ser. No. 820,520

Int. Cl.[2] F15B *11/08;* **F16K** *31/122*

U.S. Cl. 91—461 **3 Claims**

1. In a tractor vehicle having a hydraulically operated hitch including a fluid supply pump, a draft control valve assembly, a draft control cylinder assembly, a downstream control valve assembly and an unloading valve, the unloading valve comprising:

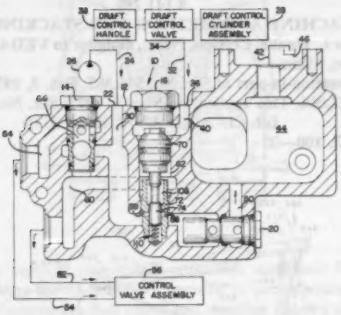
a body having a plurality of internal passages including an internal supply passage, an internal delivery passage and a draft control signal passage, the body also having an

unloading valve bore to which said plurality of internal passages have access;

an unloading spool body having a longitudinal bore therethrough and a pair of cross ports perpendicular to the longitudinal bore through the unloading spool body, the unloading spool body carried in said unloading valve bore;

an unloading spool return spring carried in said unloading valve bore and located therein through said longitudinal bore of said unloading spool body;

a tapered unloading spool having a multiple diameter internal bore and an internal fluid passage allowing fluid communication between the internal bore and the exterior of the tapered unloading spool, the unloading spool having an extended nose portion dimensionally smaller than a tapered metering portion thereof;



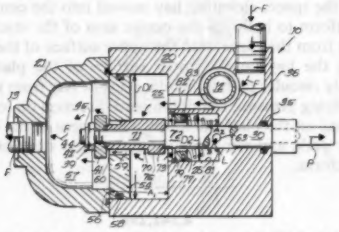
an unloading piston slidably carried in said unloading valve bore segregating said draft control signal passage from said internal delivery passage for urging said tapered unloading spool against said unloading spool return spring force sufficiently far to uncover said pair of cross ports allowing fluid communiction therethrough and from said internal supply passage to said internal delivery passage.

4,141,284

TWO STAGE POWER VALVE

Peter Wolf, Baroda, Mich., assignor to Auto Specialites Manufacturing Company, St. Joseph, Mich.

Filed Sep. 12, 1977, Ser. No. 832,556
Int. Cl.² F15B *11/20*
U.S. Cl. 91—532 **25 Claims**



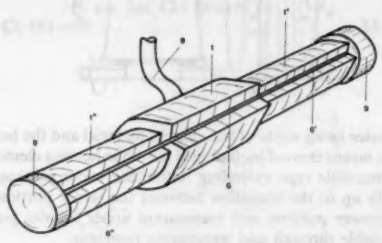
1. A power brake valve comprising a housing defining a first bore of given diameter and a second bore having a smaller diameter than the first bore and located axially adjacent to the first bore, a bi-ended rod slidable with respect to the bores, an apertured annular piston slidably disposed within each bore, the aperture defined by each annular piston including a flow space normally permitting power fluid to flow through the annular piston, a plurality of reaction pistons carried on the rod, each reaction piston radially extending to cover the flow space of an adjacent, associated annular piston and to move toward that associated annular piston to restrict and halt the normal flow of fluid through the associated annular piston and create a movable end wall, each movable end wall and immediately surrounding bore defining a collapsible chamber in the power valve, the power valve further including a fluid output port communicating with at least one collapsible chamber to direct power fluid from the collapsible chamber toward a brake actuating means when the chamber is collapsed.

4,141,285

NOZZLE FOR DRAWING OFF WELDING FUMES

Henrik V. Hendriksen, 3120 Andebu, Norway

Filed May 4, 1977, Ser. No. 793,722
Int. Cl.² F23J *11/08*
U.S. Cl. 98—115 R **6 Claims**



1. A suction nozzle assembly of the type used to draw off welding fumes adjacent a welding site when connected in fluid conducting relation to a flexible tube which leads in fluid conducting relation to a suction fan, wherein the improvement comprises an elongate tubular element having first and second open ends, said tubular element further having two mutually adjacent inwardly directed longitudinal flanges which define a slot therebetween which slot extends in a longitudinal direction for the entire length of said tubular element from the first open end to the second open end; means for telescopically adjusting the length of said tubular element in a longitudinal direction so that said slot always extends the full adjusted length of said tubular element; means for closing the ends of said element; and means for connection of said nozzle assembly to said tube; so that the entire length of said suction nozzle and the slot are correspondingly adjusted concomitantly; whereby said welding fumes may be drawn off along the entire length of said slot.

4,141,286

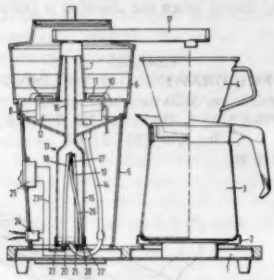
THROUGHFLOW HEATER FOR COFFEE MAKING APPARATUS

Gerard C. Smit, Amerongen, Netherlands, assignor to Smitdesign B.V., Amerongen, Netherlands

Continuation of Ser. No. 646,750, Jan. 6, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,232
Claims priority, application Netherlands, Jan. 7, 1975, 7500158
Int. Cl.² A47J *36/42*
U.S. Cl. 99—285 **5 Claims**

1. A coffee making apparatus comprising a hollow housing, a transparent water reservoir supported on said housing and having a tubular central support and a recessed central float chamber in its base, a throughflow heater having heating element means for heating water to be passed to a coffee filter, said throughflow heater being included in a water throughflow path extending from said water reservoir to an outlet pipe extending over said coffee filter, said throughflow heater having a relatively wide lower tubular portion located within said hollow housing and a relatively narrower upper tubular portion extending through the float chamber and transparent central support and the transparent water reservoir, and a

transition between said narrower upper portion and said wide lower portion, a removable closure cap on the bottom of said throughflow heater, said heating element means being disposed on said closure cap and in said lower portion, said relatively narrower upper portion extending through the transparent water reservoir, the narrower upper portion of said throughflow heater being made of transparent material and the heating element means thereof including at least one heating element of the submersible type extending within the wider portion substantially up to the transition between the wider portion and the narrower portion, said transparent upper tubular portion being visible through said transparent reservoir.

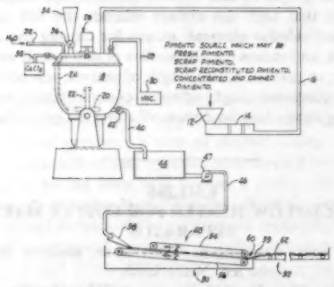


4,141,287

APPARATUS FOR THE PRODUCTION OF RECONSTITUTED PIMIENTO

Edmund H. Becker, Lakewood, and Robert O. Lindstrom, Bay Village, both of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Sep. 15, 1977, Ser. No. 833,477
Int. Cl.[2] B02C *11/08;* A21C *9/04*
U.S. Cl. 99—450.1 **5 Claims**



1. Apparatus for making reconstituted pimiento in strip form useful for stuffing olives comprising

mixing means for producing a mix of a pimiento base and a binder;

nozzle means adapted to receive said mix from the mixing means and to extrude the same at the approximate dimensions desired of said strip;

a lower longitudinally extending, continuous forming belt adjacent said nozzle means adapted to receive said mix from the nozzle means having an axial, longitudinally extending recessed are of substantially uniform dimension and said approximate dimensions;

means supporting said belt to provide a substantially flat belt upper run at a slight angle relative the horizontal thereby having a lower end and an upper end slightly higher in elevation than the lower end;

first tank means maintaining a bath setting solution at a level to immerse said belt lower end in said bath;

an upper continuous belt;

means supporting said upper belt in mating contact with the lower belt upper run to establish a closed forming trough for said pimiento base mix, the upper belt also having a lower end immersed in said bath;

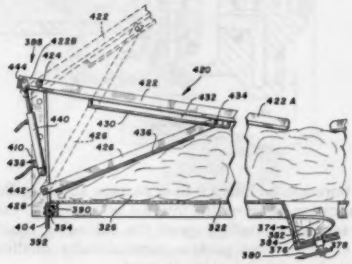
the leading point of contact between the upper and lower belts being intermediate the point of immersion of the upper and lower belts, said bath and the nozzle means.

4,141,288

MACHINE AND METHOD FOR STACKING HAY

Donald L. Henke, Creston, Nebr., assignor to VEDA, Inc., Long Lake, Minn.

Continuation-in-part of Ser. No. 546,385, Feb. 3, 1975, Pat. No. 4,022,004. This application May 9, 1977, Ser. No. 794,846
Int. Cl.[2] A01D *87/12;* B65G *3/10*
U.S. Cl. 100—35 **43 Claims**



20. A machine for making a stack of hay and like material comprising: first means having an area for accommodating a stack of hay, first movable means for moving hay into said area of the first means and toward the center of said area, second movable means for receiving hay moved by the first movable means and moving said receiving hay in an upward direction, and means for moving hay around said area to build a stack of hay.

32. A method of making a stack of hay and like materials with a machine having a platform with an upper surface and a space extended from the outer edge to the center area of the platform, said space extended in a longitudinal direction and being of a size to accommodate hay comprising: moving hay into said space from the outer edge toward the center area of the platform whereby the hay moves in the longitudinal direction of the space, elevating hay moved into the center area of the platform to build up the center area of the stack, moving the hay from the space onto the upper surface of the platform, moving the hay on the upper surface of the platform in a generally circular path to build a stack of hay from the bottom up, applying pressure in a downward direction on top portions of the hay on the platform during movement of the hay in said circular path, and removing the completed stack of hay from the platform.

4,141,289

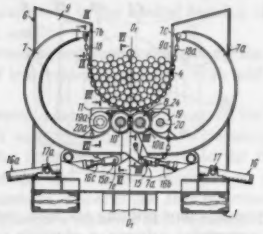
APPARATUS FOR FORMING ROUND BUNDLES OF ROD-SHAPED ARTICLES

Evgeny E. Blagov, ulitsa Lermontova, 5; Anatoly I. Panteleev, prospekt Lenina, 35/29, kv. 17, and Nikolai S. Dmitriev, ulitsa Pushkina, 28a, kv. 40, all of Elektrostal Moskovskoi oblasti, U.S.S.R.

Filed Oct. 21, 1977, Ser. No. 844,301
Int. Cl.[2] B30B *5/04*
U.S. Cl. 100—212 **1 Claim**

1. An apparatus for forming generally round bundles of rod-shaped articles, comprising: a framework; at least one pair of bell cranks with generally C-shaped working arms, pivotally

mounted on said framework symmetrically with respect to a vertical geometric axis of the apparatus, the concave sides of said working arms facing the axis of the apparatus; drive means pivotally connected with said bell cranks for effecting pivoting of said bell cranks, a receptacle adapted to accommodate the articles to be packaged, said receptacle extending to both sides of the axis of said apparatus; a device for shaping a bundle of the articles into a generally round shape, including a plurality of flexible elements, their number equalling that of said bell cranks, and guides mounted on said framework at opposite



sides of the vertical axis of said apparatus, each said flexible element having the ends thereof secured to the opposite arms of the same respective bell crank and running about a respective one of said guides, opposite to the position of the working arm of the respective one of said bell cranks in the open state of said apparatus, so that with said apparatus closed, the topmost point of said flexible elements at the area of intersection thereof directly underlying the bundle, is in direct proximity to the bottom of said receptacle; and means for timing the pivoting of said bell cranks, said timing means being symmetrically arranged with respect to the axis of said apparatus.

4,141,290

PRINT HAMMER FOR TYPE PRINTERS

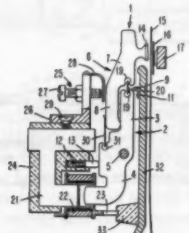
Werner Hasler, Schoenaich, and Subramaniam Padmanabhan, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,020

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629592

Int. Cl.² B41J *9/02*

U.S. Cl. 101—93.48 **8 Claims**



1. In a printer, impacting apparatus comprising:

a first lever pivotally mounted for movement between a first retracted position and a first extended position;

a second lever pivotally mounted on said first lever movable between a second retracted position and a second extended position, and so located that said second lever has formed first and second lever arms with said second lever arm having an impact portion and a greater mass than said first lever arm;

biasing means for resiliently urging each said lever to its respective retracted position;

stop means engageable by said first lever when moved to said first extended position; and

means for moving said first lever into engagement with said stop means so that the momentum of said second lever arm of said second lever rotates said second lever and said impact portion to said second extended position.

4,141,291

MECHANISM FOR ACTUATING A PLATEN IN A PRINTER

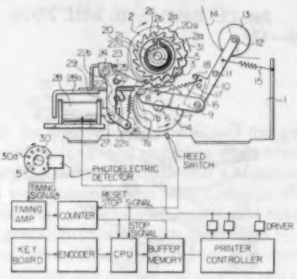
Yoshio Hata, Urawa, and Hiroyuki Harada, Kawaguchi, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed May 3, 1977, Ser. No. 793,304

Claims priority, application Japan, May 7, 1976, 51-51859; May 6, 1976, 51-56789[U]

Int. Cl.² B41J *9/38*

U.S. Cl. 101—99 **13 Claims**



1. Mechanism for actuating a platen in a printer having a plurality of printing rings independently rotatably and coaxially mounted on a driving shaft in juxtaposed relationship adjacent to each other, a stopper, each of said printing rings having a plurality of printing characters on its periphery and urged by a printing ring spring so as to be held by said stopper at a predetermined angular starting position thereof for said printing characters with respect to said driving shaft, coupling means coupling said platen with said driving shaft so as to move said platen into abutment with and away from said printing rings, driving means for rotating said driving shaft responsive to receipt of a printing command from a control circuit of said printer, arresting means for temporarily arresting each of said printing rings independently from each other against the action of said printing ring spring so as to locate a selected printing character in the respective ring at a predetermined printing position in said printer while said driving shaft is rotated so that each printing ring leaves its starting position and is moved into a printing position and is temporarily held thereat for printing in response to said printing command, the actuation of said coupling means being so interrelated in synchronism with that of said arresting means and said printing command that said platen abuts against said printing rings after having been temporarily arrested for locating said selected character in each printing ring at said printing position thereby permitting printing of said selected characters to be effected on a paper interposed between said printing rings and said platen to form a line of printing simultaneously on said paper and said platen is moved away from said printing rings before release thereof from said arresting means and, thereafter, said driving means is de-energized by said printing command to stop said driving shaft and complete one cycle of printing operation by said printing command, wherein the improvement comprises:

means engaging said driving means with said coupling means;

biasing means on said coupling means urging said platen away from said printing rings; and

cooperating means on said engaging means and said driving means for operatively associating said coupling means with said driving means during a first period that said

driving means rotates to move said platen towards said printing rings and said platen abuts said printing rings in synchronism with said driving means, and

said cooperating means comprising disassociating means on said engaging means operatively associated with said driving means but operatively disassociating said coupling means from said driving means to permit said biasing means to move said platen out of engagement with said printing rings during a second period of said driving means to separate said platen from said printing rings.

4,141,292

STENCIL HAND STAMP WITH SLIDING COVER

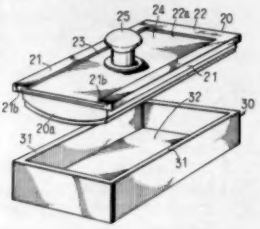
Hisashi Hirata, Tokyo, Japan, assignor to Kabushiki Kaisha Maruki Shokai, Tokyo, Japan

Filed Nov. 16, 1977, Ser. No. 851,960

Claims priority, application Japan, Dec. 9, 1976, 51-164111[U]

Int. Cl.[2] B41F *15/02*; B41L *27/26*

U.S. Cl. 101—125 **1 Claim**



1. An improvement in a mimeograph device wherein said mimeograph device has a rectangular support framework, a perforated plate convexed downwardly and applied to the undersurface of said support framework to define an ink holding chamber, an air and liquid permeable sponge member convexed downwardly and applied to the undersurface of said perforated plate and a screen convexed downwardly and applied to the undersurface of said sponge member for receiving a stencil paper on the undersurface of said screen, said improvement comprising:

a window closure plate slidably recieved in said support framework; and

wherein said support framework is integrally formed of a pair of opposite side frame members and a single end frame member integrally connected at opposite ends to the adjacent ends of said pair of side frame members to define a center window within the center of said support framework, and wherein each said side and end frame member has a continuous groove inscribed in the inner surfaces for slidably receiving said closure plate, said closure plate having attached thereto an upright knob and wherein said support framework further integrally comprises continuous downwardly extending sides to form a closed rectangular frame beneath said closure plate wherein said perforated plate and said screen each has peripheral portions disposed upwardly and inwardly with respect to said frame formed by said downwardly extending sides, said peripheral portions of said perforated plate resiliently urging said peripheral portions of said screen tightly against the inner surfaces of said downwardly extending sides forming said frame to thereby retain said screen,

whereby a mimeograph is formed from a single integral frame, having a minimum number of components to define said ink holding chamber, which ink holding chamber is readily accessible by a completely removable closure plate slidably fitted into said integral support framework thereby decreasing the complexity and cost of said mimeograph.

4,141,293

ROTARY MULTI-COLOR PRINTING MACHINE

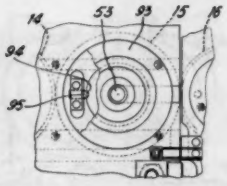
Louis G. Corse, l'Etang, France, assignor to Machines Chambon, Orleans, France

Filed May 3, 1977, Ser. No. 793,309

Claims priority, application France, May 7, 1976, 76 13688

Int. Cl.[2] B41F *5/06, 13/40*

U.S. Cl. 101—181 **13 Claims**



1. A rotary multi-color printing machine, particularly of the offset type, comprising a frame, a plurality of printing units carried by said frame and superposed one above the other so that sheet material, on which the various colors are to be printed, can pass through them successively, each printing unit comprising four horizontal rolls, which are situated at the same level and whose axes are parallel, the four rolls being constituted by a counter-pressure roll, a blanket roll, a plate roll and an inking roll, the inking roll forming part-of an inking means for inking said plate roll; the machine further comprising a support which is slidable relative to the frame of the printing machine in a direction which is horizontal and axial with respect to the four rolls, the plate roll and the blanket roll of each of the printing units being rotatably mounted on said support, whereas the counter-pressure roll of each printing unit is rotatably mounted on said frame at one side of the support, and the inking roll of each printing unit is rotatably mounted on said frame at the other side of the support.

4,141,294

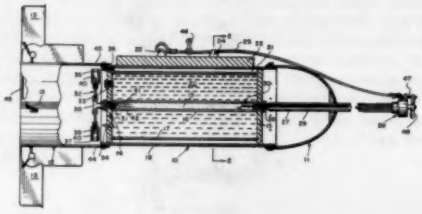
FUEL-AIR TYPE BOMB

Sidney D. Zaharia, Westminster, Colo., assignor to Beech Aircraft Corporation, Wichita, Kans.

Filed Apr. 28, 1969, Ser. No. 823,235

Int. Cl.[2] F42B *25/12*

U.S. Cl. 102—6 **5 Claims**



1. A non-incendiary fuel-air cloud forming explosive bomb comprising:

a housing having a plurality of interior chambers;

a confined body of low brisance heaving type, fuel dispersing explosive located centrally in a first chamber within the housing;

a separately confined body of normally non-explosive, flammable liquid fuel surrounding the body of low brisance explosive in a second chamber within the housing;

a separately confined body of high vapor pressure, high heat absorbing capacity fluid surrounding the body of fuel in a third chamber within the housing;

a proximity fuse supported by the housing near its foreward end;

shock wave transmitting means connecting the fuse detonator with the interior of said body of low brisance explosive;

a fuel-air cloud detonating assembly carried by the aft end of the housing, including

(a) a confined small quantity of high explosive, and

(b) a milliseconds time delay detonator associated with said high explosive for detonating the high explosive a predetermined number of milliseconds after the low brisance explosive in the central housing chamber has exploded; and

shock wave transmitting means connecting the interior of the body of low brisance explosive with said time delay detonator,

whereby the time measuring component of the time delay detonator is actuated when the low brisance explosive explodes, the time delay affords time for the heaving explosion of the low brisance explosive to rupture the housing chambers, disperse the fuel in minute particles into the air to form a fuel-air mixture, aerosol type, highly explosive free standing cloud adjacent the target, and the small high explosive charge of the cloud detonating assembly is exploded to detonate the entire cloud after it has formed during the milliseconds time delay.

4,141,295

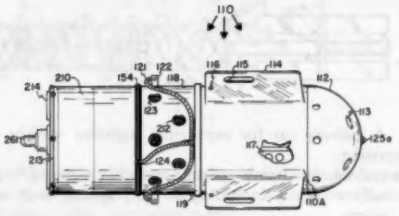
ACTUATION MINE SIMULATOR

John M. Campbell; Herbert L. Ball; Darrell A. Bymoen, all of Ridgecrest; Douglas G. Ewen; Ronald D. Hise, both of China Lake, all of Calif.; Charles R. Stribley, Scottsdale, Ariz., and Gaylon L. West, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1978, Ser. No. 879,286

Int. Cl.[2] F42B *22/04*

U.S. Cl. 102—10 **36 Claims**



1. A mine simulator, comprising:

a housing defining a water-tight compartment;

a float having a plurality of signaling devices;

a tetherline having two ends and a first predetermined finite length, said line being attached on one end to said housing and attached on the other end to said float;

detecting means within said compartment for producing a ship count signal in response to the proximate passage of a body;

processing means within said compartment and communicating with said detecting means for producing a signaling device launch signal in response to a predetermined number of said ship count signals;

recording means within said compartment and communicating with said processing means for making a permanent record of said ship count signals; and

sequencing means within said float communicating with said processing means and with said signaling devices for selectively activating said signaling devices in response to said launch signals.

4,141,296

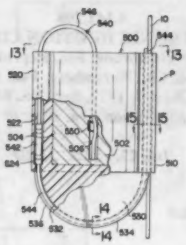
CARRIER FOR EXPLOSIVE PRIMER AND METHOD OF USING SAME

Brooke J. Calder, Jr., Aurora; David L. Childs, Solon; Roger N. Prescott, Lyndhurst, all of Ohio, and Donald W. Lyons, Madisonville, Ky., assignors to Austin Powder Company, Beachwood, Ohio

Filed Nov. 11, 1976, Ser. No. 740,799

Int. Cl.[2] F42B *3/10*

U.S. Cl. 102—24 R **24 Claims**



5. A carrier for supporting a primer and for guiding said primer along a detonating cord extending into a borehole from the open, charging end thereof and into a location with said primer in detonating relationship with a charge of explosive material spaced from said charging end of said borehole, said charge being generally immune from detonation by said detonating cord and detonatable by said primer, said carrier including: means for holding said primer spaced from said detonating cord a distance preventing said cord from detonating said primer directly; means for slidably securing said carrier with respect to said detonating cord whereby said carrier can move freely and longitudinally along said cord; supporting means on said carrier for supporting on said carrier an elongated time delay detonation element having an input portion and extending in a generally linear path from said extending detonating cord to said primer; said supporting means including means external of said primer and spaced from said detonating cord for maintaining a non-detonation spacing between said input portion of said time delay element and said primer; and, means on said carrier for slidably associating said input portion of said element in detonation contact with said detonating cord.

4,141,297

IGNITION CIRCUITS

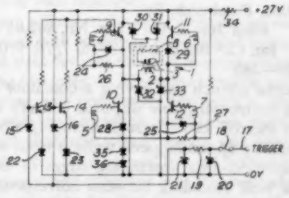
Raymond E. Sellwood, Slough, England, assignor to M.L. Aviation Company Limited, Slough, United Kingdom

Filed Apr. 28, 1977, Ser. No. 791,873

Claims priority, application United Kingdom, May 4, 1976, 18195/76

Int. Cl.[2] F42C *11/00*

U.S. Cl. 102—206 **10 Claims**



1. An ignition circuit assembly for an explosive device of the kind having an electrically-energisable heating element for igniting the explosive device, and a transformer secondary

winding connected to the heating element, the circuit assembly comprising, a transformer primary winding to be coupled magnetically to the secondary winding by proximity of the explosive device and the circuit assembly; a generator circuit operable to feed an electrical signal to the transformer primary winding for inducing in the transformer secondary winding an energising current for the heating element to cause ignition of the explosive device; and an inhibiting circuit to inhibit operation of the generator circuit until a trigger signal is applied to the inhibiting circuit to cancel the inhibition.

4,141,298

ELECTRONIC IGNITION CIRCUIT

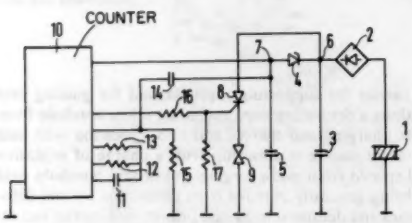
Peter F. Weidner, Breitenbrunn, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,266

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653452

Int. Cl.[2] F42C *11/02*

U.S. Cl. 102—210 **9 Claims**



1. In an electronic ignition circuit for the self-destruction of a projectile fuse, including two condensers; a generator for charging said condensers; and a delay circuit for initiating the discharge of a first of said condensers through an igniter, said generator charging said first condenser to a voltage required for said igniter and charging the second condenser to a voltage required for said delay circuit, the improvement comprising: said first condenser having a capacitance commensurate with the voltage and energy required for the ignition of said igniter and said second condenser having a capacitance commensurate with the voltage and energy required for the operation of said delay circuit; a semiconductor element being connected between the voltage potential poles of said condensers, said element being conductive above a voltage threshold value and preventing a charge equalization between said two condensers, said voltage threshold value being slightly below the voltage attainable at charging of said first condenser and corresponds to the difference between the voltages required for said igniter and for said delay circuit.

4,141,299

DUMPING RAILWAY QUENCH CAR

Donald L. Friend, McCandless Township, Allegheny County; John A. Grosko, West Mifflin Borough, and Ernest S. Lanyi, Elizabeth Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 2, 1977, Ser. No. 802,837

Int. Cl.[2] B61D *3/04, 3/16, 7/10, 9/02*

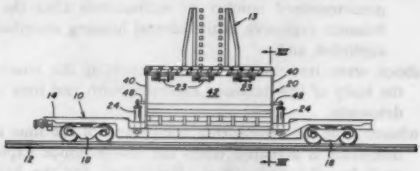
U.S. Cl. 105—260 **2 Claims**

1. In a coke quench car having a container for receiving coke and a horizontal frame disposed beneath said container for support thereof, said container including a bottom wall, a pair of generally upstanding end walls, a front wall extending between corresponding upstanding edges of said end walls, and a back wall extending between corresponding edges of said end walls opposite said front wall, the improvement in said quench car which comprises:

said bottom wall being pivotally mounted on a substantially inclined position sloping from an upper end engaging the front wall to form a closure therewith, to a lower end engaging the backwall, and movable to an inclined position sloping downward in the opposite direction sufficiently to dump coke through the opening formed between said front wall and said bottom wall;

said back wall being pivotally joined along one edge thereof to said bottom wall for articulating movement therewith between said end walls;

a back plate extending between corresponding upstanding edges of said end walls adjacent the back wall, the upper



edge of said back wall being in constant slidable engagement with the back plate and extending to about mid-height of the end walls in the lowered coke receiving position, and to about the full height thereof in the raised coke dumping position; and

fluid motor means on each side of said end walls connected between said frame and said back walls for moving said bottom wall and said back wall along said back plate in articulated fashion between coke receiving and coke dumping positions.

4,141,300

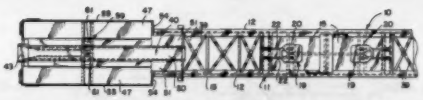
RAILWAY CAR FOR HIGHWAY TRAILERS

Walter J. Marulic, Gary, Ind., and Ray L. Ferris, Thornton, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jun. 15, 1977, Ser. No. 806,791

Int. Cl.[2] B65J *1/22*

U.S. Cl. 105—368 S **12 Claims**



1. A railway car for supporting highway vehicle means comprising:

an intermediate frame structure including a pair of longitudinally vertically extending laterally spaced main support beams,

reinforcing members extending laterally and connecting said beams,

a platform supported on said beams and extending outwardly from the center of said car for supporting vehicle hitch means at the center portion of the car,

end structures each including a stub center sill connected to a respective opposing end of said intermediate frame,

each center sill comprising a box-like structure and overlapping the intermediate frame structure in extending between said beams defining an overlapping region between each end structure and an outer end of the intermediate structure,

shear means connecting each of said stub center sills with the longitudinal end portions of the beams at the overlapping region,

each end structure further including a pair of longitudinally extending vehicle wheel supporting treadways each being spaced longitudinally outward of a respective intermediate structure and being disposed on a respective outer side of a respective stub sill and being positioned below the upper edges of said respective stub sill,

said treadways further each having outer portions being

spaced laterally outward of a respective main support beam and having underposed first laterally and vertically extending bearing means supporting same, said first bearing means being connected with and having its outer portions extending laterally outwardly of the end of the associated main support beam at the overlapping region,

means reinforcing said treadways including longitudinally extending support means being connected to the underneath surfaces of said treadways,

outwardly projecting bolster bearer means and end bearer means being longitudinally spaced of the car and connected to said center sills supporting said means reinforcing, and

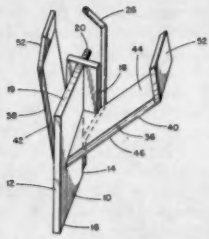
each of said end structures having longitudinally extending side sills laterally outward of the main support beams connected with the laterally outer ends of said respective bolster and end bearer means and the first bearing means.

4,141,301

CULTIVATOR AND LIQUID FERTILIZER BLADE

Kenneth M. Coldren, Fort Wayne, Ind., assignor to M & W Gear Company, Gibson City, Ill.

Filed Dec. 9, 1976, Ser. No. 749,071
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—7 **4 Claims**



1. An improved cultivator and liquid fertilizer knife construction for attachment to a shank member, said knife construction comprising, in combination:

a main knife blade having a leading edge, a trailing edge, a lower edge and an upper end, said blade being inclined relative to the soil surface when in the working position with the lower edge forward of the upper end;

a fertilizer discharge tube attached at the trailing edge with a trailing discharge outlet adjacent the lower edge;

a weld bead on the opposite sides of the main knife blade adjacent the discharge tube and forward of the trailing edge for diverting soil from the discharge tube;

means for attaching the main knife blade to a shank; and

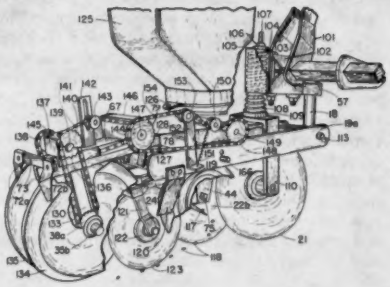
first and second wings having ouside tips and a leading edge, said wings being uncurved, coplanar and forming an angle of about 130° with the leading edge of the knife blade, said arms extending transversely from the main knife blade on opposite sides and swept back relative to the direction of intended blade travel at an angle of about 45°, said wings being substantially parallel to the surface of soil as it is plowed, the leading edge of said wings being sharply beveled, the dimension of said wings between the outside tips being in the range of about six to twenty times the thickness of the main knife blade.

4,141,302

FURROW OPENER AND APPARATUS FOR NO-TILLAGE TRANSPLANTERS AND PLANTERS

John E. Morrison, Jr., Lexington, Ky., and Charlie F. Abrams, Jr., Raleigh, N.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 618,971, Oct. 2, 1975, Pat. No. 4,090,456.
This application Oct. 21, 1977, Ser. No. 844,418
Int. Cl.[2] A01C *5/06*
U.S. Cl. 111—52 **20 Claims**



1. A unit planter for the opening of furrows under no-tillage conditions and for planting of seeds comprising in combination:

a. a tool bar set at an angle and affixed to two depth gauge wheels by means of adjustable strut members;

b. a front support comprising: a tubular bar positioned horizontally with two parallel vertical plates affixed to opposing sides of the tubular bar which fit to said tool bar, and a pivot assembly, said front support secured to said tool bar by means of a clamp and two long bolts, said tubular bar also supporting a compression cylinder;

c. said compression cylinder comprising: a compression spring which transfers weight and is used to maintain flexibility over rough terrain, a rod positioned inside the center of said compression spring to guide said spring, a rod stop to limit the travel of said compression spring, said rod being pivotally affixed to an arch which is shaped like a runing fork in the vertical position with the open end down, said arch providing lifting force and a ring located between the base of said spring and said arch to properly position said spring onto said arch;

d. said tubular bar being affixed to a pivot shaft which allows for angular motion of the entire unit-planter and communicates with a front frame member assembly which is rigidly affixed to the arch which also provides mounts for a rolling coulter which is positioned vertically on the centerline of the unit-planter;

e. a seed metering mechanism affixed to a seed hopper and mounted on a first cross member which is affixed to the front frame member assembly, said seed metering mechanism also being affixed to a tube which communicates with a remote seed reservoir;

f. a vertical strut affixed to the first crossmember and extending downward with mounting pads affixed to each side of the vertical strut for mounting an opening assembly;

g. said opening assembly, to effect disc location on each side of the coulter and communicating with a front frame assembly, said seed metering mechanism metering seed through said seed-tube which directs said seed into the furrow which has been opened by said furrow opener;

h. a seed firming wheel mounted on a bearing hub and supported by a pivoting bracket for pressing said seed into contact with soil in the bottom of the furrow which has been opened;

i. a rear frame laterally pivoting by means of a vertical pivot shaft, said shaft being rigidly affixed to a second cross-

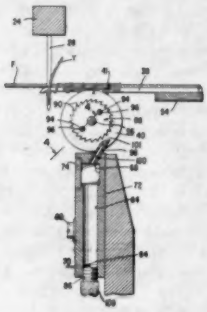
member on the centerline of the machine, at the point of intersection of the centerline of the furrow opener assembly and the centerline of a set of rear press wheels of a rear press wheel assembly so that the rear press wheels will travel on the very same curved path as followed by the furrow opener when being towed by a towing means, vertical movement on said vertical pivot shaft being restrained by a washer and pin assembly, a journal block circumambient to said vertical pivot shaft and having communicating with a tube frame, said tube frame being affixed to a third crossmember which provides a lifting means for said rear press wheel assembly and means to limit lateral pivoting limitation to avoid drive chain disengagement during transport, said third crossmember affixed with two stops which communicate with said rear press wheel assembly which communicates with said journaled bearing block which is affixed to a changeable sprocket which communicates with a drive chain which communicates with a sprocket affixed to a shaft journaled in said block, said shaft also having a second changeable sprocket which drives a chain over tightener comprising two tightener spools and said chain communicating with said sprocket on said shaft which communicates with said seed mechanism.

4,141,303

ROTARY KNIFE MODULE FOR TUFTING MACHINES

Jimmie D. Scott, Harrison, Tenn., and William F. Weldon, Austin, Tex., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Jan. 27, 1978, Ser. No. 872,881
Int. Cl.[2] D05C *15/00*
U.S. Cl. 112—79 R **16 Claims**



1. A rotary knife module carrying a plurality of spaced apart circular knife blades, at least one turbine wheel drivingly connected to said knife blades, means for rotatably mounting said knife blades and turbine wheel in said module with the periphery of said blades free for cutting, a nozzle for impinging a fluid upon each turbine wheel, said nozzle having an outlet and an inlet supported in said module with the outlet disposed adjacent said turbine wheel, said module including a body member having means defining a hollow cavity therein communicating with the inlet of said nozzle, and means for communicating said cavity with a source of fluid.

4,141,304

AUTOMATIC SEWING MACHINE

Kohji Masuda, Sagamihara, Japan, assignor to Kayaba Industry Co., Ltd., Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,118
Int. Cl.[2] D05B *27/06*
U.S. Cl. 112—153 **7 Claims**

1. An automatic sewing machine comprising: sewing means for successively sewing edges of a workpiece extending in angular relationship to each other;

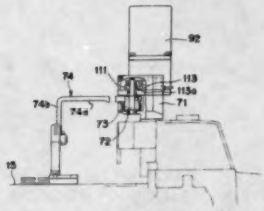
work advancing means for advancing the workpiece in a work advancing direction toward said sewing means;

guide means for continuously aligning a given edge of the workpiece being sewn during a sewing operation with said work advancing direction; and

turning means for turning said workpiece to align the next successive edge thereof contiguous to said given edge with said work advancing direction, so that said next successive edge may be sewn after said given edge, said turning means comprising:

a rotatable member rotatable about a fixed point in a first direction from a predetermined initial position toward said next successive edge of said workpiece;

clamp means supported by said rotatable member and rotatable therewith for clamping opposite sides of said next successive edge of said workpiece;



detection means for detecting when said clamp means has been moved by said rotatable member to a position such that said next successive edge of said workpiece may be clamped by said clamp means and for then stopping the rotation of said rotatable member in said first direction, thereby maintaining a relative positional relationship between said clamp means and said next successive edge of said workpiece; and

means for causing said rotatable member to rotate in a second direction opposite to said first direction, after said clamp means has clamped said opposite sides of said next successive edge of said workpiece, and for returning said rotatable member to said predetermined initial position, thereby turning said workpiece about the sewing point of said sewing means until said next successive edge of said workpiece is aligned with said work advancing direction.

4,141,305

ELECTRONIC PATTERN CONTROL FOR A SEWING MACHINE

Hideaki Takenoya, Hachioji, and Hachiro Makabe, Fussa, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jul. 29, 1977, Ser. No. 820,393
Claims priority, application Japan, Jul. 30, 1976, 51/90193
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **10 Claims**

1. In a sewing machine, in combination,

stitch-forming means operative for changing the relative positions of the needle and the material being sewn in the course of sewing a stitch pattern;

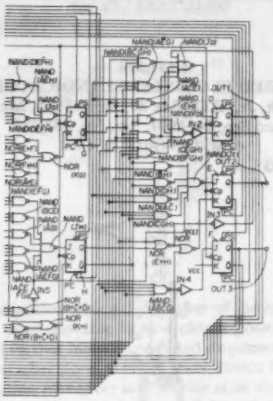
drive means operative for controlling the stitch-forming means in dependence upon received stitch-control data;

pulse-generating means generating synchronizing pulses in synchronism with the operation of a cyclically operative component of the sewing machine;

logic circuit means operative in response to successive synchronizing pulses for generating and applying to the drive means stitch-control data for successive stitches of the stitch-pattern to be sewn but without storing simultaneously all the stitch-control data for all the stitches of the stitch pattern to be sewn,

the logic circuit means assuming successive states in response to successive synchronizing pulses,

the logic circuit means when in its successive states producing successive state data, each state data comprising stitch-control data for a stitch of the stitch pattern,



the logic circuit, in performing transitions to successive states, generating and thereby bringing into existence the state data for successive states by deriving it from the state data of preceding states.

4,141,306

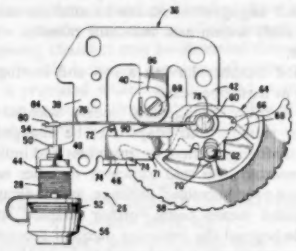
THREAD TENSIONING APPARATUS FOR SEWING MACHINES

Karl Weber, Kaiserslautern, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 749,577, Dec. 10, 1976. This application Oct. 31, 1977, Ser. No. 846,970

Int. Cl.[2] D05B *47/00*

U.S. Cl. 112—254 **9 Claims**



1. In a sewing machine, a tension device including spaced friction discs for applying frictional resistance to movement of a thread therebetween, axial shiftable means operably connected to said discs for initiating movement of said discs relative to one another, an elongated spring connected at one end to said axial shiftable means and connected at the opposite end to fixed structure of the machine, an abutment means disposed for contacting one side of said elongated spring between the opposite ends thereof, and slidable tension adjustment means including a fulcrum projection disposed for bearing against the other side of said elongated spring means between said one end of said elongated spring means and said abutment means such that a force will be applied to said axial shiftable means through said elongated spring means in accordance with the position of said fulcrum projection relative to said one end and said abutment means.

4,141,307

THREAD CUTTING MECHANISM FOR SEWING MACHINES

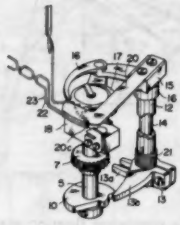
Ryohei Okada, Takahama, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 22, 1977, Ser. No. 835,592

Claims priority, application Japan, Sep. 24, 1976, 51-114849

Int. Cl.[2] D05B *49/00*

U.S. Cl. 112—292 **5 Claims**



1. A sewing machine having a vertically extending shuttle driving shaft and means for rotating the shaft, the sewing machine comprising:

a shuttle device including a shuttle race provided on the shuttle driving shaft, a shuttle body having an upper surface and housed in said shuttle race for providing a supply of lower thread, shuttle body retaining means provided at one side of said shuttle race for holding said shuttle body against rotation, and a shuttle body opener provided at a side of said shuttle race opposite to said retaining means and adapted to engage, when actuated, with said shuttle body for controlling resistance against the drawing out of the lower thread therefrom;

a needle mounted for vertical reciprocating movement and adapted to feed an upper thread into operative engagement with said shuttle device; and

a thread cutting mechanism including:

a second vertically extending shaft;

a thread catcher arm disposed at the side of said shuttle race opposite to said shuttle body opener and secured at one end of said second shaft for swinging movement between an advanced position in which said catcher arm is extended over the upper surface of said shuttle body and a retracted position in which said catcher arm is retracted from the upper surface of said shuttle body for catching the threads in return movement;

a moveable cutting edge provided on said thread catcher arm;

a stationary cutter edge for cooperation with said moveable cutting edge to cut thread when said catcher arm returns from said advanced position to said retracted position;

a cam fixedly connected to said driving shaft;

a cam follower fixedly connected to said second shaft;

electromagnetic means for rotating said second shaft in a direction opposite to said shuttle driving shaft for bringing said catcher arm into said advanced position and at the same time bringing said cam follower into an operative position wherein it can be engaged with said cam which is rotated with said driving shaft;

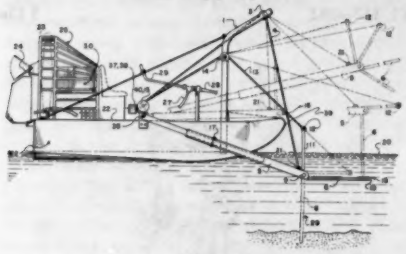
said cam having a profile which, upon rotation of said shuttle driving shaft, engages said cam follower to effect return movement of said catcher arm from said advanced position to said retracted position; and

means for actuating said shuttle body opener to restrain the drawing out of the lower thread from said shuttle body when said catcher arm returns from said advanced position to said retracted position.

4,141,308
AQUATIC DEBRIS REMOVING SYSTEM

Russell H. Gainey, 85 Happy Jack La., Port Sulphur, La. 70083

Filed Sep. 18, 1975, Ser. No. 614,689
Int. Cl.[2] B63B *35/32*
U.S. Cl. 114—270 3 Claims

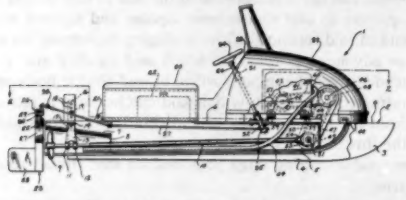


1. An apparatus for removing floating matter from the surface of a body of water, comprising:
   a. a buoyant support structure;
   b. propeller means associated with and mounted on said buoyant structure for moving said buoyant structure across the surface of said body of water; and
   c. scoop means connected to said support structure for removing said floating matter from the surface of said body of water, said scoop means provided with a plurality of substantially parallel elongated tines, said tines being capable of anchorably securing said scoop to the water bottom of said body of water.

4,141,309
INBOARD POWERED WATERCRAFT

Robert V. Halboth, 2177 S. 35th St., Milwaukee, Wis. 53215

Continuation-in-part of Ser. No. 759,338, Jan. 14, 1977, abandoned. This application Jul. 21, 1977, Ser. No. 817,500
Int. Cl.[2] B63B *35/72*
U.S. Cl. 115—70 8 Claims

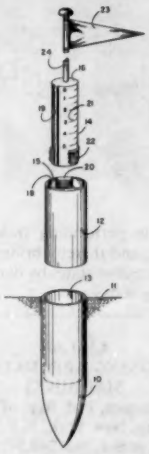


1. In a watercraft, a pair of transversely spaced pontoons forming a catamaran-type hull having a deck and providing laterally spaced planing surfaces, a lift plate extending between the pontoons, said lift plate extending downwardly and rearwardly from a location spaced rearwardly from the front of the pontoons to a location spaced forwardly from the rear of the pontoons and forming a longitudinally extending recess between the pontoons, a wake plate extending between the pontoons, said wake plate being spaced above and extending rearwardly from the lift plate to form an opening therewith aligned with said recess, a longitudinally extending shaft disposed in the recess and extending rearwardly through said opening and carrying a propeller on the rear end thereof and rearwardly of said pontoons, drive means for said propeller shaft mounted on said hull and including pulley means, said drive means further including a transversely extending shaft supported beneath the deck and coupled to the forward end of the propeller shaft, said transversely extending shaft being generally longitudinally and horizontally aligned with the opening formed between the lift plate and the wake plate to provide for near horizontal mounting of the propeller shaft, and mounting means on said hull for an engine having pulley means, said engine mounting means providing for universal movement of an engine in a generally horizontal plane to place the respective pulley means into proper alignment and spaced relation to drive said propeller.

4,141,310
POURED FLOOR LEVEL INDICATOR

Rodney W. Rich, Jr., P.O. Box 83, Steep Falls, Me. 04085

Filed Sep. 14, 1977, Ser. No. 833,225
Int. Cl.[2] G01F *23/00*
U.S. Cl. 33—293 7 Claims

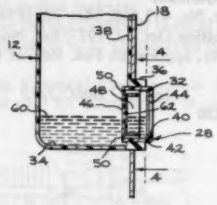


1. A device for indicating the level of poured floors cmprising:
   an indicator member receipt shaft having defined therein an indicator member receipt shaft aperture;
   receipt shaft engagement means located on said indicator receipt shaft within said indicator member receipt shaft aperture;
   an indicator member having a top and having imprinted thereon at least one scale;
   indicator member engagement means located upon said indicator member and adapted to be engaged with said receipt shaft engagement means when said indicator member is inserted into said indicator member receipt shaft aperture a predetermined distance, said indicator member engagement means being further adapted so as not to protrude beyond the indicator member receipt shaft, said indicator member's top adapted to be at the level of the floor to be poured after said indicator member is inserted into said indicator member receipt shaft said predetermined distance;
   said indicator member engagement means further including:
      a key slot defined within said indicator member receipt shaft;
      a key section located on said indicator member adapted to mate with said key slot;
      a plurality of first engagement projections equidistant from one another arranged in a column along the inside of the indicator member receipt shaft within the indicator member receipt shaft aperture; and
      at least one second engagement projection located on said indicator member adapted to mate with said first engagement projections when said indicator member is inserted into said indicator member receipt shaft a predetermined distance and is rotated.

4,141,311
LIQUID LEVEL INDICATING DEVICE FOR MOVABLY MOUNTED DISPENSER TANKS

Benson T. Taylor, Jr., Floyd Knobs, Ind., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 16, 1977, Ser. No. 852,118
Int. Cl.² G01F *23/00*
U.S. Cl. 116—227 **7 Claims**



1. In combination with a dishwasher of the type including a dishwasher door movable from a closed position to an open position and further including a liquid dispenser tank mounted to said dishwasher door, a liquid level device for providing a visual indication whenever said level is at or above a predetermined level in said tank when said dishwasher door is in the open position, said indicator device comprising:

an indicator housing having a viewing chamber formed therein, said indicator housing being mounted to said dispenser tank on a side thereof from which the liquid retreats upon opening said dishwasher door;

a sight window positioned in said indicator housing to allow observation of said viewing chamber;

said indicator housing further being mounted on the inside of said dishwasher door to be visible when said dishwasher door is in the open position;

means causing a quantity of liquid in said dispenser tank to flow into said viewing chamber when said dishwasher door is in the closed position and said liquid level is at or above said predetermined level in said dispenser tank;

said indicator device further including means for retaining a quantity of said liquid flowing into said dispenser tank upon movement of said dishwasher door to the open position, whereby the presence of said quantity of liquid in said viewing chamber may be observed through said sight window in said indicator housing, whereby a visual indication is provided whenever the liquid in said dispenser tank is at or above the predetermined level when said dishwasher door is in the open position.

4,141,312
APPARATUS FOR HISTOLOGICAL TISSUE PROCESSING

Nevitt M. Louder, and Carlo E. Cuomo, both of Verona, Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed May 16, 1977, Ser. No. 797,366
Int. Cl.² G01N *1/30*
U.S. Cl. 118—7 **12 Claims**

1. Apparatus for processing histological tissue specimens comprising:

(a) a vacuum tight container for specimens and treating fluids having a removable cover for unencumbered placement of specimens in the container, said container having a single opening for inlet and drain at the bottom thereof,

(b) first and second valves in communication with the inlet and drain opening in the container,

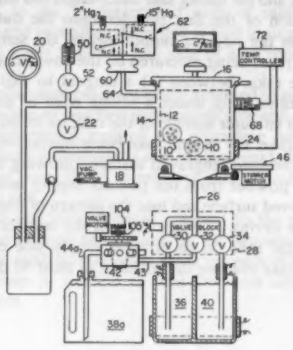
(c) a container for warm impregnant or the like in communication with said first valve,

(d) a third valve having a plurality of selectable ports and a common port connectable to any of said selectable ports, said common port in communication with said second valve,

(e) a plurality of treating fluid containers in communication with said selectable ports on said third valve,

(f) a vacuum pump in communication with said specimen container,

(g) a vacuum exhaust valve in communication with said specimen container,



(h) means for controlling the first, second and third valves, the vacuum pump and the vacuum exhaust valve to sequentially draw treating fluids into said specimen container and return the treating fluids to their respective containers, and finally to draw warm impregnant into said specimen container to treat histological tissue specimens.

4,141,313
APPARATUS FOR THE PATTERNED DEPOSITION OF POWDERED THERMOPLASTICS ADHESIVE MATERIAL ON THE OUTER SURFACE OF A SURFACE FORM

Josef Hefele, Gräfelfing, Fed. Rep. of Germany, assignor to Kufner Textilwerke KG, Fed. Rep. of Germany

Filed Jul. 19, 1976, Ser. No. 706,588
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532998; Aug. 19, 1975, 2536911
Int. Cl.² B05C *19/00*
U.S. Cl. 118—212 **12 Claims**

1. Apparatus for the patterned deposition of two adhesive powders of different melting behavior in superimposed layers of substantially equal thickness on an outer-engraved surface, comprising an engraved roller having the outer-engraved surface provided with a pattern of depressions therein for receiving the adhesive powders as the engraved roller is coated and as said engraved roller is moved in a path of movement, adhesive powder supply means having circumferentially spaced first and second places of supply for coating the engraved roller at circumferentially spaced powder supply intervals with the powders having different melting characteristics, the engraved roller and its outer-engraved surface being movable relative to said supply means for receiving first one type of adhesive powder and then the other type of adhesive powder after being raked, and a first make downstream of the first

place of supply and a second rake downstream of the second place of supply and said rakes both being in the path of movement of said engraved roller and associated with said supply means and said engraved roller and with the first rake having a setting angle extending from the outer-engraved surface of the engraved roller which is greater than a similar angle of the second rake and for raking said outer-engraved surface following deposition of the first powder onto the outer-engraved surface from the powder supply means, the setting angle of each of the rakes being measured on the powder supply side of each of the rakes between (a) a tangent to that part of the engraved roller lying under a raking edge of the associated rake and (b) an outer surface of the rake on its powder supply side of the rake, the second rake being operatively associated for raking the outer-engraved surface following deposition of the second powder from the powder supply means onto the outer-engraved surface and into the pattern of depressions, the second rake having a setting angle of the tangent to the outer surface of the rake on its powder supply side on the point, where the rake touches the roller of at most 90 degrees.

4,141,314

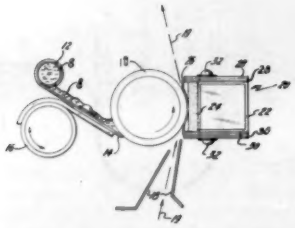
PHOTOCOPYING SYSTEMS

David C. Newson, Harefield, England, assignor to GAF Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,272

Int. Cl.² B05C *1/08*

U.S. Cl. 118—246 **7 Claims**



1. An improved developing apparatus for use in a photocopying system comprising a rotatably mounted application roller, means for dispensing developer material onto the surface of said application roller, a metering blade mounted for engagement with the surface of said application roller for wiping the surface of said application roller, and pressure application means matching the contour of the application roller mounted for applying pressure to copy paper as said copy paper passes in direct contour contact with the surface of said application roller for receiving developer material therefrom so that said copy paper is squeezed between said pressure application means and said application roller, said pressure application means remaining in direct contour contact with said application roller when said roller is stationary.

4,141,315

APPARATUS FOR COATING FIBERS, THREADS AND SHEETS

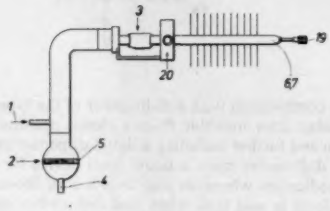
Heinrich Nassenstein; Richard Menold; Fritz Feld, all of Leverkusen; Konrad Ellegast, Leichlingen; Roland Weisbeck, Odenthal; Hans G. Gelhaar, Dormagen; Lothar Ruetz, Dormagen, and Friedrich W. Elsasser, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 472,365, May 22, 1974, abandoned. This application Oct. 12, 1977, Ser. No. 841,466

Claims priority, application Fed. Rep. of Germany, May 22, 1973, 2325827

Int. Cl.² B05C *3/12*

U.S. Cl. 118—420 **1 Claim**



1. An apparatus for uniformly applying a coating of a liquid system in a predetermined quantity to a fiber, thread or sheet comprising

(a) a foaming chamber including a gas inlet for introducing blowing gas into the chamber, a liquid inlet for introducing a liquid system into the chamber, foaming means for dispersing the gas in the liquid to form a foam on the liquid surface, and outlet means for discharging the foam from the chamber to form a cushion of built-up foam adapted to envelop a linearly moving stream of fibers, threads or sheets, said outlet means comprising a pair of spaced parallel pipes communicating with said foaming chamber, each pipe including a longitudinally-extending slot on the inner surface thereof for discharging the foam to form a cushion between the pipes, and said foaming means comprising a frit disposed above the gas inlet, whereby the liquid system is foamed by disposing the liquid system over the frit and blowing gas through the frit into the liquid system;

(b) means for regulating the spacing between the pipes and means for regulating the length of each slot; and

(c) means for moving the foam under pressure from the surface of the liquid through the outlet means.

4,141,316

APPARATUS FOR THE TREATMENT OF POWDERY OR GRANULAR MATERIAL

Gustav Grun, Vogelsbergstr., 6474 Ortenberg 2, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,491

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602454

Int. Cl.² B05B *17/04;* B05C *5/02;* B01J *8/24;* A23C *11/00*

U.S. Cl. 118—303 **7 Claims**

1. Apparatus for use in treatment of powdery and granular substances comprising:

a vertical, rotationally symmetrical vessel with respect to its vertical axis, said vessel having a head portion;

a cylindrical wall being disposed in said vessel against said head portion and symmetrical with respect to said vertical axis, said cylindrical wall being spaced from inner side surfaces of said vessel to provide a larger inner chamber and a smaller annular outer chamber within said vessel;

vortex-introducing inlet means disposed in said head portion of said vessel and directed downwardly into said inner

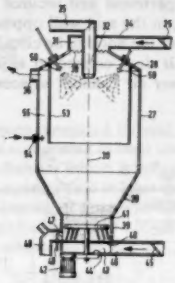
chamber for passing the substances into said inner chamber of said vessel in a vortex flow condition;

1 first gas inlet means directed downwardly into said inner chamber and disposed uniformly around said vortex-introducing inlet means for providing a substantially axially parallel flow of a downward-moving gas stream to carry the substances;

spray nozzle means disposed in said head portion within said inner chamber of said vessel for spraying the substances with liquid and molten material;

said inner chamber having a selected vertical length to allow the sprayed substances to be undisturbed for a preselected time interval;

said vessel having a conical lower portion disposed below said cylindrical wall for constriction of the sprayed sub-



stances downwardly toward a smaller bottom portion of said vessel;

fluidized layer bed means disposed between said conical lower portion and said bottom portion of said vessel for closing off downward movement of the sprayed substances to said bottom portion;

second gas inlet means directed upwardly through said bottom portion of said vessel and said bed means for delivering a counterflow of an upward-moving gas stream into said vessel;

said first and second gas inlet means being directed toward each other; and

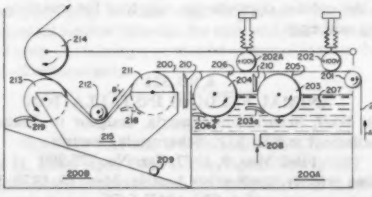
gas outlet means disposed within said outer chamber adjacent to said head portion of said vessel to provide an exit from said vessel for said counterflow of the upwardmoving gas stream.

4,141,317

MULTIPLE APPLICATOR ROLLER TONER STATION

Kishor M. Lakhani, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 5, 1977, Ser. No. 839,715
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—661 **10 Claims**



1. In an electrographic printing system wherein a recording medium moves along a predetermined path, said printing system including a print station for applying a latent electrostatic charge to a recording medium and a toner station for applying to the recording medium a toning liquid comprised of a suspension of colored particles in a volatile carrier, the improved apparatus for applying the toning liquid to the recording medium and for removing the volatile carrier from the recording medium for fixing the colored particles permanently to the recording medium comprising in combination:

a receptacle for containing the toning liquid comprised of a suspension of colored particles in a volatile carrier;

a first roller-applicator rotatably mounted on said receptacle adjacent to the predetermined path of said recording medium and partially submerged in said toning liquid, for applying toner liquid to one side of said recording medium;

a second roller-applicator rotatably mounted to said receptacle in tandem to said first roller-applicator and adjacent to the predetermined path of said recording medium, and also partially submerged in said toning liquid, for applying additional toner liquid to said one side of said recording medium; and,

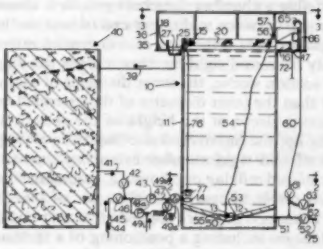
at least one bias roller located adjacent to the path of the recording medium and situated on the opposite side of the recording medium and offset along the path of the recording medium in relation to said first and second roller applicators.

4,141,318

FISH CULTURE TANK

Thomas S. MacVane; Jon M. Lindbergh, both of Bainbridge Island, Wash., and Barry A. Friedman, West Nyack, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 756,853
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—3 **12 Claims**



1. A fish culture tank having self-cleaning properties, including in combination:

a tank having a cylindrical side wall,

an inverted conical bottom wall with a normally closed central drain opening therethrough,

overflow collection and removal means at the upper end of the cylindrical wall,

a drain conduit leading away from said drain opening,

tangential inlet means through said cylindrical wall close to the outer periphery of the inverted conical bottom wall, whence water inflow sends up a rising helical flow,

airlift means connected to the drain conduit for carrying the liquid and solids from said drain opening up above the upper end of the tank,

a closed receiving container into which the airlift means empties,

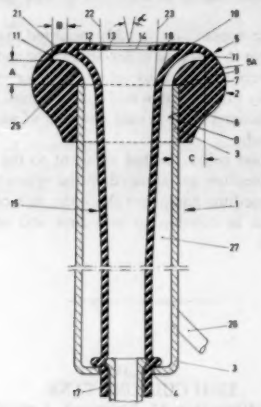
a sloping mesh slide inclined from the upper end of said receiving container down to the upper edge of said tank, for passing through the liquid and catching large solids and for enabling live fish to reenter the tank, and

a drain conduit beneath said sloping mesh slide.

4,141,319
RUBBER TEAT HOLDER FOR MILKING CUPS

Jakob Maier, Türkheim, Allgäu, Fed. Rep. of Germany, and Tilman Hoefelmayr, Zürich, Switzerland, assignors to Kuenzler & Co., Berneck, Switzerland

Filed Apr. 27, 1976, Ser. No. 680,671
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1975, 2518897
Int. Cl.[2] A01J 5/04
U.S. Cl. 119—14.47 13 Claims



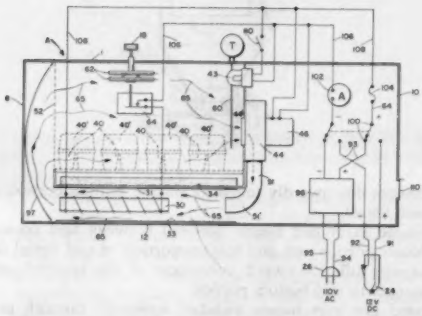
1. In a rubber teat holder for milking cups comprising a suction sleeve which is more conically enlarged at its upper end than at its lower end and having a holding edge thereon which is engaged with a milking cup housing to form a rigid member, said suction sleeve extending into said milking cup housing and being less in diameter than said milking cup housing to define a chamber therebetween, first means defining an annular gap between said upper end of said suction sleeve and said rigid member, a thin and elastic ring lip extending radially inwardly from said rigid member toward the longitudinal axis of said suction sleeve, the inner diameter of said ring lip being smaller than the inner diameter of the extended conical part of said suction sleeve at the height of the radially inner edge of said ring lip, the improvement comprising an upper extremity portion of said rigid member extending above the upper extremity of said milking cup housing, second means for effecting an enlargement of said inner diameter of said ring lip in response to suction pressure applied at least to said chamber, said second means including a positioning of a terminal end of said annular gap above said milking cup housing to define a base point between said ring lip and said upper extremity portion of said rigid member, said ring lip intermediate said base point and said inner diameter joining said upper end of of said suction sleeve to form a transition point, said annular gap extending generally horizontally between said base point and said transition point, said ring lip being pivotal at changing pressure differences between outside atmosphere and pressures within said annular gap about said base point and with respect to said rigid member due to the resulting lever action of the part of said ring lip between said base point and said transition point to effect said enlargement of said inner diameter.

4,141,320
PORTABLE EGG TRANSPORTING UNIT

Hubert P. Hatfield, 218 W. Riverview Rd., Baltimore, Md. 21225

Filed Sep. 29, 1976, Ser. No. 728,463
Int. Cl.[2] A21B 1/22; F27D 11/02
U.S. Cl. 119—37 1 Claim

1. A portable egg incubator and transporting unit comprising a horizontal rectangular cabinet having a vertical wall positioned at one end of the cabinet to form a relatively small separate compartment within the cabinet, a single air channel extending along and adjacent the bottom of the cabinet from the said vertical wall to the opposite end of the cabinet, a moisture supply pan positioned adjacent the bottom of the cabinet and above the air channel, the moisture supply pan extending from the vertical compartment wall to a line positioned inwardly from the opposite end of the cabinet to provide an opening between the opposite end of the moisture supply pan and the opposite end of the cabinet for allowing air to pass from the channel adjacent the bottom of the cabinet to the upper portion of the cabinet, a moisture retaining pad of sponge-like material and of such size as to fit within said moisture supply pan, an air-flow-through egg supporting tray positioned above and in a plane parallel with the moisture supply pan, a hood for housing a fan member positioned within the said separate compartment and secured to the vertical wall having an opening in the said wall opposite the said hood for allowing air to enter the hood to be circulated by said fan, said hood having an air duct connected adjacent the lower side leading to the lower air channel adjacent the bottom of the



cabinet, the lower end of the said air duct being angled substantially parallel to a plane parallel with the bottom of the moisture supply pan allowing for circulation of the air from the hooded fan through the bottom air channel to the upper portion of the cabinet and over the egg-supporting tray and into the opening in the said vertical wall to the hood to be recirculated, at least one heating unit positioned within the air channel adjacent the bottom of the cabinet and spaced upwardly from the bottom of the cabinet for heating air passing therethrough, a thermometer within said cabinet and positioned adjacent the opening in the hood having means extending through the top of the cabinet for reading the temperature within the cabinet and an electrically controlled thermostat positioned within the cabinet and in the area of the air stream passing over the egg-supporting tray having means extending through the top of the cabinet for adjusting the said thermostat and a handle means secured to the top surface of the cabinet for carrying said portable egg incubator and transporting unit, a closable opening in the cabinet opposite the egg tray for inserting and removing said eggs.

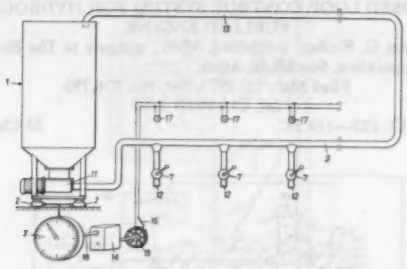
4,141,321
ANIMAL FEEDING INSTALLATION

Johann Wolf, Scharnstein, Austria, assignor to Johann Wolf Gesellschaft m.b.H. KG., Scharnstein, Austria

Filed Mar. 9, 1977, Ser. No. 775,990
Claims priority, application Austria, Mar. 15, 1976, 1880/76
Int. Cl.[2] A01K 5/00
U.S. Cl. 119—51 R 16 Claims

1. An installation for delivering flowable feed to a plurality of animal feeding stations, comprising a feed storage container, delivery conduit means connected to said container and having outlet means and being adapted to deliver feed from said container to and through said outlet means, shut-off valve means

for controlling the delivery of feed through said outlet means, measuring means connected to said container to measure the quantity of feed which has been removed from said container during the delivery of feed through said outlet means, indicating means connected to said measuring means to indicate the



quantity which has been measured by said measuring means, said indicating means comprising at least one signal generator, and a contacting mechanism which is controlled by said measuring mechanism to operate said at least one signal generator in response to the measuring of a predetermined selected increment of feed by control of said shut-off valve means.

4,141,322

INSECTICIDAL COLLAR FOR ANIMALS

Mack N. Evans, 1006 Maplewood Ct., and James D. Burnett, Rte. 5, Edgewood Village, both of Martinsville, Va. 24112

Filed Apr. 8, 1977, Ser. No. 785,951
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—106 **3 Claims**

1. An animal collar comprising:

an elongated strap comprising first and second substantially longitudinally and transversely coextensive elongated laminae secured together, said strap being adapted to be disposed about an animal's neck with the second lamina being innermost and against the animal's neck, means defining in said first outermost lamina a plurality of outwardly extending transverse loops spaced longitudinally from each other throughout the length of the strap; and

an elongated strip laced through said loops with the second innermost lamina between the strip and the animal's neck, said strip containing a pesticidal composition for the control of ectoparasites.

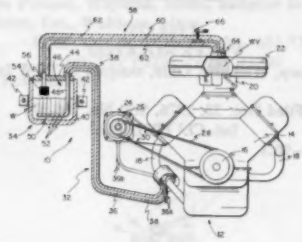
4,141,323

WATER VAPOR INJECTION SYSTEM

Radford H. Hart, Apex Post Office, Apex, N.C. 27502

Continuation-in-part of Ser. No. 440,550, Feb. 7, 1974, abandoned. This application Jan. 11, 1978, Ser. No. 868,518
Int. Cl.[2] F02M *25/02*
U.S. Cl. 123—25 B **7 Claims**

1. A water vapor injection system for adding moist air to the air-fuel mixture passing through a carburetor into the combustion chamber of an engine, said water vapor system comprising: a water container means completely independent of the engine and engine cooling system adapted to contain a volume of water therein for moistening air being passed therethrough prior to reaching said engine; an air inlet means operatively connected to said water container means, and including interior air inlet means extending interiorly of said container means and having air exit opening means disposed at a position below the normal level of the water in said container means; an air pump means operatively connected to said air inlet means for forcing ambient air therethrough and into said water container means and out said air exit opening means and through said volume of water within said container means, such that a turbulent churning action is realized as the forced air moves through the water in said water container means and the air



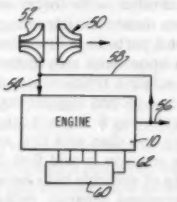
becomes moistened air in the process; means for heating the forced air generated by said pump means prior to entering said water container means; an air outlet means operatively connected between said water container means and the carburetor intake area of said engine for receiving the moistened air leaving said water container means and delivering the same to the carburetor of said engine where said moistened air mixes with the air passing through the carburetor into the combustion chambers of said engine; and control valve means interconnected between said water container means and said carburetor for selectively diverting the moistened air moving through said air outlet means to the atmosphere such that the engine may be purged and cleared with only normally humidified air passing through the engine prior to shut down.

4,141,324

LOW EMISSION INTERNAL COMBUSTION ENGINE

Albert M. Karaba, Muskegon, Mich., assignor to United States of America, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,303
Int. Cl.[2] F02M *59/20;* F02D *23/00;* F02M *25/06;* F02B *75/04*
U.S. Cl. 123—32 R **11 Claims**



8. An internal combustion engine having a cylinder and a piston movably mounted in said cylinder, said piston being movable toward a top dead center position, a main combustion chamber formed in part by said piston, and having a volume which is at a minimum when said piston is at said top dead center position, a pre-combustion chamber opening to said main combustion chamber, means for introducing air into said main chamber and fuel into said pre-combustion chamber whereby said air will be directed into said pre-combustion chamber to ignite with said fuel to thereby provide ignition of

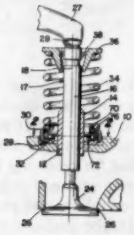
the fuel and air in said main combustion chamber, the volume of said pre-combustion chamber being in the range of 70% to 85% of the combined volume of said pre-combustion chamber and said main combustion chamber when said piston is at said top dead center position; and in which said engine has an intake connected with said main combustion chamber, means for supercharging the air delivered to said intake, said supercharger means being provided with a compressor having an outlet opening to said intake of said engine, said engine being provided with means for exhausting gases from said main combustion chamber, means connecting said exhausting means to said compressor outlet whereby at least a portion of the exhaust gases are recirculated to the intake of said engine only at engine loads less than 40% of maximum engine load.

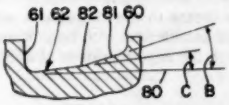
4,141,325

VALVE ROTATOR

John H. Shalaty, Wickliffe, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 23, 1976, Ser. No. 754,074
Int. Cl.[2] F01L *1/32*
U.S. Cl. 123—90.3 **9 Claims**





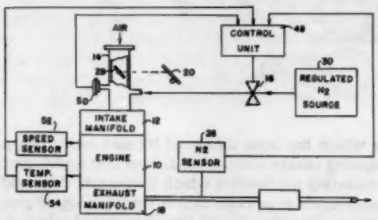
1. A rotator for a valve which is reciprocable between opened and closed positions along a longitudinal axis and is rotatable about said axis, said rotator including first and second parts movable axially and rotatably relative to one another along and about said axis, variable force applying means for urging said valve towards said closed position and urging said parts toward one another with forces which alternately increase and decrease, means for imparting relative rotation to said first and second parts in a first direction and of a first angular magnitude upon axial movement toward each other and for restricting relative rotation in a direction opposite to said first direction to a second angular magnitude of said parts upon axial movement away from each other, said second angular magnitude being less than said first angular magnitude to yield a net positive rotation in said first direction, said means including a plurality of shiftable balls between said parts movable along predetermined separate paths for imparting said relative rotation thereto, means defining pockets in one of said parts for receiving a respective ball and for constraining said respective ball to move in its predetermined separate path, each of said pockets having a ramp along which the ball moves upon relative axial movement of said part, means biasing the ball to one end of the ramp, the ball moving toward the other end of the ramp when said first and second parts move axially toward each other, at least one of the ramps being defined by a plurality of surface portions which extend at different angles to a plane extending perpendicular to said longitudinal axis, the surface portion adjacent said one end of said ramp extending at the greatest angle to said plane and the angle at which any other surface portions extend to said plane being progressively less as said ramp progresses toward the other end thereof.

4,141,326

CLOSED LOOP CONTROL SYSTEM FOR HYDROGEN FUELLED ENGINE

William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 11, 1977, Ser. No. 776,793
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EC **33 Claims**



15. A closed loop fuel control system for a hydrogen fuelled engine, wherein said engine includes a source of hydrogen fuel and an engine control, the position of which is indicative of a commanded engine torque, comprising:

means for generating a hydrogen feedback signal having a value indicative of the concentration of unburned hydrogen in the residue of the engine's combustion process emitted as an exhaust gas; and

means for controlling the quantity of hydrogen and an oxidizing agent delivered to the engine in response to the position of said engine control and said hydrogen feedback signal to cause the engine to generate the commanded torque with the exhaust gas having a predetermined quantity of unburned hydrogen.

4,141,327

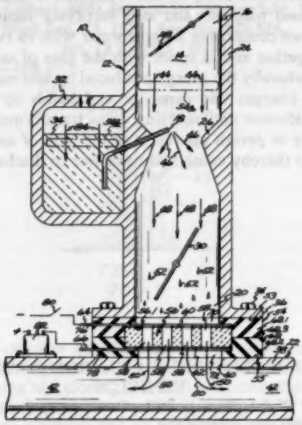
EARLY FUEL EVAPORATION CARBURETION SYSTEM

Leo Marcoux, Rehoboth, and Peter G. Berg, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1976, Ser. No. 721,728
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 F **10 Claims**

1. In combination, carburetor means having an air-fuel passage, an air inlet to said air-fuel passage for admitting air to said passage at varying temperatures, a fuel inlet to said air-fuel passage for mixing fuel with air in said air-fuel passage, an outlet from said air-fuel passage for delivering a mixture of air and fuel to an engine, and means movable in the air-fuel passage to selectively vary the volume of the air-fuel mixture delivered to the engine; and heater means for said air-fuel mixture which display variable heat-output in response to variation in the volume or temperature of said air-fuel mixture delivered to the engine, said heater means comprising a body of ceramic resistor material of positive temperature coefficient of resistivity adapted to display a sharp anomalous increase in electrical resistivity when heated to a selected temperature, said body having a plurality of heater passages extending through the body between opposite ends of the body, means mounting said body with said heater passages aligned with said air-fuel passage to pass said air-fuel mixture through the heater passages in heat-transfer relation to the body, and means for directing electrical current through the resistor body material

for heating the body to transfer selected heat to the varying volume or temperature of air-fuel mixture directed through the



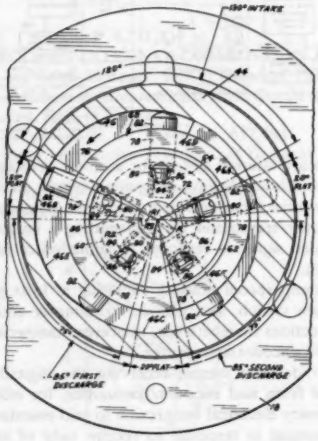
heater passages for facilitating mixture of the air and fuel prior to delivery of said air-fuel mixture to the engine.

4,141,328

MOTOR DRIVEN ROTARY FUEL PUMP

Larry J. Tipton, Florissant, and Steven D. Bryant, Fenton, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,456
Int. Cl.[2] F02M *59/12, 41/14;* F04B *1/16*
U.S. Cl. 123—138 **5 Claims**



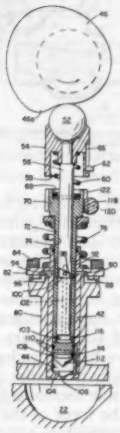
1. In an internal combustion engine, having a fuel supply, a carburetor connected to the intake manifold of the internal combustion engine, a fuel supply line extending from the fuel supply to the carburetor, and a fuel supply pump in the supply line to the carburetor; the improvement comprising a motor driven fuel metering pump in the supply line between the fuel supply pump and the carburetor to meter the supply of fuel from the supply pump to the carburetor, said fuel metering pump including a fixed housing having a rotor chamber therein with an inner peripheral wall surface, a rotor eccentrically mounted within the rotor chamber, said rotor having a plurality of radially extending piston chambers therein, each piston chamber having a piston therein with an outer end thereof extending outwardly beyond the circumference of the rotor and in continuous contact with the inner peripheral wall surface defining the rotor chamber to move in a radial direction during rotation of the rotor, a fuel inlet from the fuel supply line in fluid communication with the piston chamber during a portion of the rotation of the rotor to supply fuel to the piston chamber, and a fuel outlet to the carburetor in fluid communication with the piston chamber during a separate portion of the rotation of the rotor to supply fuel to the carburetor.

4,141,329

INTERNAL COMBUSTION ENGINE FUEL INJECTION SYSTEM

Francesco Pompei, Wayland, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Apr. 30, 1976, Ser. No. 681,777
Int. Cl.[2] F02M *39/00, 42/00*
U.S. Cl. 123—139 B **13 Claims**



1. In an internal combustion engine having at least one cylinder defining a piston chamber, a compression piston reciprocable axially of said chamber, and a cylinder head cooperating with said compression piston while adjacent one end of its stroke to define therewith a combustion chamber wherein air is compressed by said compression piston while moving toward said end of its stroke;

a fuel injection system comprising the combination of:

pressurizing means adjacent said combustion chamber having a compression chamber and a compression means operative to further compress in said compression chamber a relativey small part of the air precompressed by said compression piston in said combustion chamber to a substantially higher pressure and temperature than the peak pressure and temperature of air compressed by said compression piston in said combustion chamber;

fuel feed means including a fuel metering piston coaxial with and internal to said compression piston, said fuel metering piston and said compression piston constrained for relative movement with respect to one another, said fuel metering piston independently movable, said compression piston moved only by movement of said fuel metering piston, said fuel feed means operative only after initiation of compressive action of said compression means to supply a metered quantity of combustible fuel to said compressed body of air in said compression chamber; and

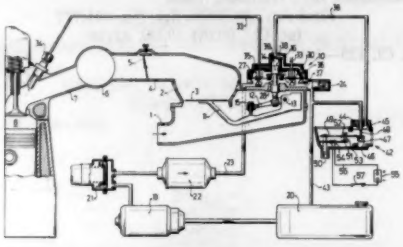
nozzle means communicating said compression chamber with said combustion chamber and operative to confine at least most of the air in said compression chamber during said further compression thereof and to discharge said

confined compressed air mixed with said fuel as a jet into said combustion chamber.

4,141,330
PRESSURE REGULATING VALVE FOR FUEL INJECTION SYSTEMS

Walter Schlott, Rommelshausen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1977, Ser. No. 798,522
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623122
Int. Cl.[2] F02M *39/00, 1/02*
U.S. Cl. 123—139 AW **5 Claims**

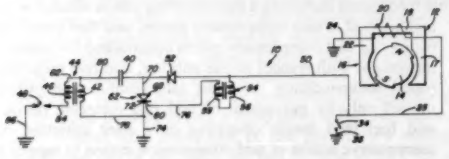


1. A pressure regulating valve for a fuel injection system for a mixture-compressing, externally ignited, internal combustion engine having a suction duct including an air-flow sensor member which is displaced by the amount of air flowing through it against the restoring force produced by a pressure fluid, said pressure fluid being continuously conveyed to a control pressure conduit under constant pressure and changeable at will by means of said pressure regulating valve, said pressure regulating valve further including a movable valve component one side of which is under the action of said pressure fluid and the other side thereof being under the action of a pressure spring with the force of the pressure spring being decreasable by a first temperature-responsive element further characterized in that a second temperature responsive element is arranged in said pressure regulating valve for engagement with said first temperature-responsive element so that said second temperature-responsive element acts in the direction of reducing the force of said first temperature-responsive element on the pressure spring.

4,141,331
BREAKERLESS CAPACITIVE DISCHARGE IGNITION SYSTEM

Marion Mallory, Jr., Carson City, Nev., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 282,654, Aug. 22, 1972, Pat. No. 3,842,817. This application Oct. 21, 1974, Ser. No. 516,494
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **1 Claim**

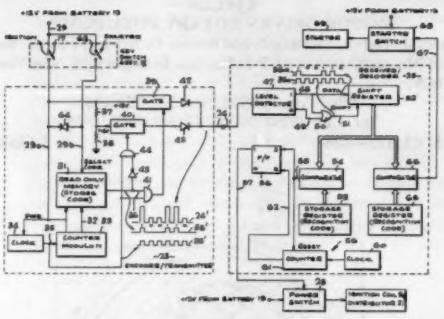


1. A magneto driven breakerless capacitive discharge ignition system including an ignition coil for at least one spark plug to be energised by said system; the combination comprising a series circuit of said magneto, rectifying means, the capacitor, and the primary side of said ignition coil, a controlled rectifier connected to said series circuit between said rectifying means and said capacitor to control the discharging of said capacitor and a parallel time delay circuit connected to said series circuit between said magneto and said rectifying means, said time delay circuit comprising a transformer with its two sides connected together and in series with the gate of said controlled rectifier; whereby the energy produced by said magneto simultaneously charges said capacitor and builds up in said time delay transformer until said time delay transformer is energised sufficiently to permit operation of the gate of said controlled rectifier to thereby cause said capacitor to discharge.

4,141,332
ENCODED ELECTRICAL CONTROL SYSTEMS FOR VEHICLES

Leopold S. Wyler, Beverly Hills, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Feb. 23, 1976, Ser. No. 660,686
Int. Cl.[2] F02P *9/00, 11/00*
U.S. Cl. 123—148 R **10 Claims**



1. A secure ignition system for a motor vehicle having an ignition switch and having an ignition system electrical component essential for engine operation, said system comprising:

an encoder/transmitter for transmitting a unique, digitally encoded signal in response to actuation of said ignition switch,

a first tamperproof housing enclosing at least part of said ignition switch, said encoder/transmitter and the interconnections therebetween, to prevent tampered actuation of said encoder/transmitter,

receiver/decoder means, receiving the digitally encoded signal from said encoder/transmitter, for effectuating a necessary electrical connection to said essential electrical component in response to receipt only of said unique, encoded signal,

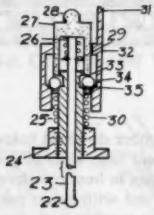
another tamperproof housing enclosing at least part of said essential electrical component, said receiver/decoder means and the interconnections therebetween, to prevent tampered effectuation of said necessary electrical connection, together with

another like encoder/transmitter and receiver/decoder means, said other encoder/transmitter transmitting a different unique, encoded signal in response to actuation of said ignition switch to the "engine start" position, and wherein said other receiver/decoder actuates the starter of said motor vehicle in response to reception only of said different encoded signal.

4,141,333
VALVE TRAIN SYSTEMS OF INTERNAL COMBUSTION ENGINES

Raymond D. Gilbert, 6501 Inwood Dr., Springfield, Va. 22150

Filed Jan. 13, 1975, Ser. No. 540,516
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F 14 Claims

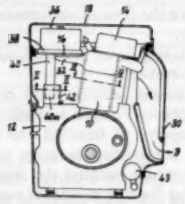


1. A multi-cylinder internal combustion engine comprising:
(a) at least one cylinder having an intake and an exhaust port, the opening and closing of which are controlled by valve trains including an intake pushrod and an intake valve and an exhaust pushrod and an exhaust valve, respectively, each said pushrod comprising two coaxial sections, one of which is telescopically received within the other, and said pushrods and said valves being operatively connected by a rocker arm which is pivoted about a single fixed axis; and
(b) means for axially varying the effective length of a first pushrod in order to hold the operatively connected valve of said cylinder closed continuously, said means being operable to selectively hold the two coaxial sections of said pushrod in axially fixed maximum-length relationship or to permit relative axial movement, whereby said cylinder may be prevented from passing any vapors through said valve port.

4,141,334
SOUND-PROOFED INTERNAL COMBUSTION ENGINE

Ernst Hatz, and Erich Absenger, both of Ruhstorf, Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,893
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634203
Int. Cl.[2] F02B *77/00*; F01P *1/02*
U.S. Cl. 123—198 E 5 Claims

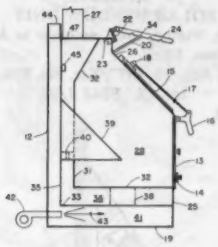


1. In combination with an internal combustion engine having a casing which is spaced from and fully surrounds the engine body for the purpose of providing sound absorption, an air cooling blower which draws into said spacing between said casing and said engine body cooling air through an elongated, multiply curved inlet channel means which is lined with sound-absorbing layers, an elongated outlet channel means on said casing through which the cooling air exits to the outside after passing through said spacing between said casing and said engine body, said elongated outlet channel means being lined with sound-absorbing layers, a filter housing means arranged within and being separate from said inlet channel means and housing an air filter element therein, said filter housing means including an elongated air inlet means into said filter housing means and extending into said spacing between said casing and said engine body.

4,141,335
DUAL MODE FURNACE

Otis L. Wright, 9511 Telstar Dr., Richmond, Va. 23234

Filed Aug. 22, 1977, Ser. No. 826,910
Int. Cl.[2] F24H *3/10*
U.S. Cl. 126—111 9 Claims

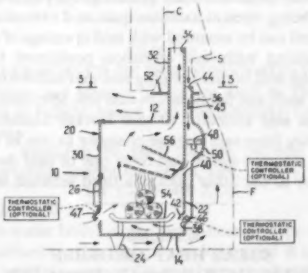


1. A furnace comprising a first compartment for the combustion of a solid fuel, a second compartment for the combustion of a fluid fuel, a chamber interposed between said compartments through which air can be circulated in a manner to absorb heat from the walls of said compartments, each of said compartments being constructed at least in part of a thermally conductive material and provided with openings for escape of combustion fumes and admission of air to support combustion, and baffles positioned within said chamber for modifying the flow characteristics of air passing therethrough to achieve improved transfer of heat from the walls of said compartments, the bottom of said first compartment being positioned generally above said chamber which is generally positioned above said second compartment.

4,141,336
FIREPLACE STOVE

John C. Fitch, Lime Rock Rd., Lakeville, Conn. 06039

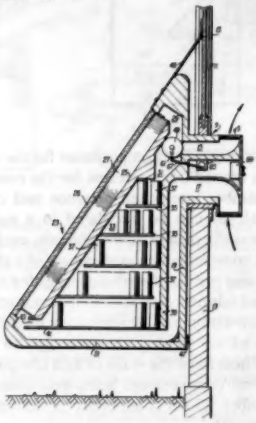
Filed Jan. 27, 1977, Ser. No. 763,128
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 14 Claims



1. A stove for a fireplace having a chimney flue which includes a lower end opening to the fireplace comprising top, bottom, back and side walls and a front door defining a firebox shaped and dimensioned to be received at least partly within the fireplace, at least one stove flue leading from the top wall of the firebox and adapted to extend up into the lower end of a chimney flue to conduct smoke from the firebox to the chimney flue from an outlet opening at the upper end of the stove

flue, at least one duct leading to the firebox from the chimney flue and having at least one outlet opening in the firebox to conduct a gas that includes oxygen from the chimney flue into the firebox to support combustion of combustible material in the firebox, the duct having an inlet opening adapted to be located within the chimney flue at a location below the outlet opening from the stove flue to the chimney flue, and closure means at the lower end of the chimney flue for substantially preventing air flow between the fireplace and the chimney flue.

4,141,337
SOLAR WINDOW UNIT
Bernard J. Bergen, Vinton, Iowa, assignor to Addison Products Company, Addison, Mich.
Filed Aug. 19, 1977, Ser. No. 826,140
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **9 Claims**



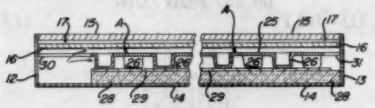
1. A window-mountable, solar-heating unit comprising a solar heat collector in a body adapted to be mounted on the outside of a building, a heat-storage chamber containing material which extracts and stores heat, a first duct communicating with one side of said collector and one side of said chamber, a second duct communicating with another side of said collector and another side of said chamber, said first and second ducts extending away from said body at least about one and one-half inches, and being open at locations past said extension, so that said entire unit can be mounted with said openings of said ducts inside a building with said extension positioned through a window in the wall of said building and said collector mounted outside said wall; and fan means in said unit selectable to circulate air from said collector to said storage chamber in one selected status; from said storage chamber to one of said ducts in a second selected status, and from one of said ducts across said collector to the other duct in a third selected status.

4,141,338
SOLAR HEAT ABSORBER
George O. G. Lof, 3367 S. Willow Ct., Denver, Colo. 80231
Filed Aug. 18, 1975, Ser. No. 605,671
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **3 Claims**

1. In a solar heat collector including a housing having a solar radiation transparent cover with cool air inlet means at one end and heated air outlet means at the opposite end, the improvement comprising:

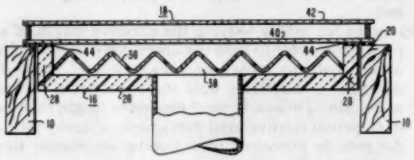
a heat absorbing member comprising a sheet of thin metal formed with a surface generally parallel to and disposed in spaced relation to said transparent cover and arranged for the passage of air at least under said sheet,

a series of discontinuities comprising generally rectangular projections formed by depressing said metal facing away from the cover, and



a metal planar member disposed below said heat absorbing member with said heat absorbing member mounted by said discontinuities in heat transferring relation with said planar member and with an air passage formed between the heat absorber member and planar member.

4,141,339
SOLAR HEAT COLLECTOR
Albert Weinstein, Alexandria, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 15, 1977, Ser. No. 816,130
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **6 Claims**



1. A flat-plate solar air collector adapted for installation in cooperative relation with a building frame construction in which the adjacent framing members for an exterior surface of the building are spaced from each other a given distance, said collector comprising:

a rigid frame member made of a relatively low density thermal insulation material and formed into the shape of a shallow channel having opposite side flanges and a bottom web, said insulation material being the only material present in and forming the finished frame member;

solar insolation absorbing plate means in said frame member and located to define with said web an air flow passage therebetween for the flow of air from one end to the other of the collector;

flat transparent glazing cover means covering the open side of said frame member;

adhesive-sealant means securing said cover means to the edges of said opposite flanges, said adhesive-sealant means having the property of flexibility to permit differential expansion and contraction between said frame member and said cover means without the loss of adherence and sealing and being the sole means for supporting said frame member from said cover means;

said frame member having an outside width generally corresponding to said given distance between said framing members and said cover means having a width generally corresponding to the center-to-center distance of adjacent framing member so that, in the installed position of said collector, said frame nests between said framing members with the projecting margial edge portions of said cover means being supported by the outer surfaces of said framing members;

gasket means between the marginal edge portions of said cover means to said framing members;

whereby an area of the exterior surface of the building is formed by the collector alone, and the framing members

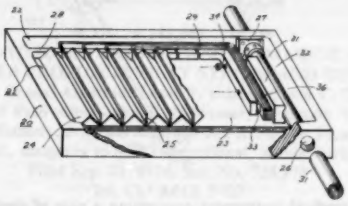
and the collector serve to stiffen and support each other in a complementary relationship.

4,141,340

SOLAR ENERGY COLLECTOR

William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54304

Filed Jun. 8, 1977, Ser. No. 804,767
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 10 Claims



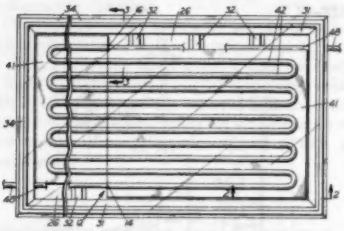
1. Apparatus for collecting, concentrating, and transmitting solar energy, including at least one reflector surface for directing the solar rays to a focus area, the reflector surface having a nadir and a ridge, absorption means disposed at least in part in said focus area, a heat transfer medium external to the focus area, and a heat conduit operatively interconnecting said absorption means and said transfer medium, each of the absorption means, transfer medium and heat conduit disposed above the nadir.

4,141,341

SOLAR HEATING PANEL

Arden T. Eby, Box 268, Redmond, Oreg. 97756

Filed Apr. 4, 1977, Ser. No. 784,380
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 2 Claims



1. A solar heating panel comprising:

(a) a collector shell having a bottom, side walls, and being open on the top, including inner and outer fiberglass boxes and a closed cell urethane liner sandwiched therebetween all bonded into an integral assembly;

(b) said inner box including a plurality of upwardly extending, inverted, truncated, V-shaped expansion ridges extending transversely thereacross;

(c) a heat transfer coil configured for placement within said collector shell having an inlet and outlet passing through said collector shell;

(d) a collector sheet adapted for fitting in said collector shell intermediately adjacent to said expansion ridges and said heat transfer coil for collecting solar energy and transmitting it to said heat transfer coil; and

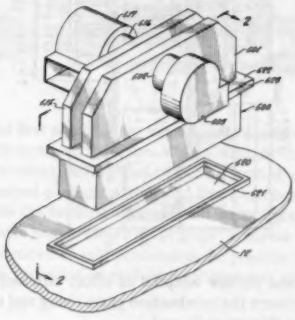
(e) a window enclosing said top of said collector shell.

4,141,342

APPARATUS FOR EXTRACTING GREASE AND SMOKE, AND METHOD AND APPARATUS FOR INSTALLING THE SAME

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Division of Ser. No. 607,283, Aug. 25, 1975, Pat. No. 4,056,877, which is a division of Ser. No. 509,555, Sep. 26, 1974, Pat. No. 3,952,640. This application Oct. 20, 1977, Ser. No. 843,709
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 D 20 Claims



7. A grease hood and plenum apparatus mounted at the ceiling of a restaurant kitchen, which comprises:

(a) a grease hood incorporating grease filters and also incorporating means to direct make-up air toward said grease filters,

said make-up air passing through a capture chamber the bottom of which is open for reception of fumes from a cooking appliance disposed therebeneath,

(b) an extended exhaust plenum projecting upwardly from said hood to draw air and fumes through said filters,

(c) a supply means extending upwardly from said hood to supply said make-up air thereto,

(d) blower means to deliver make-up air to said supply means and to draw air and fumes from said extended exhaust plenum,

(e) a kitchen ceiling having an opening therein sized and shaped to receive downwardly therethrough said grease hood in premanufactured condition, and

(f) means to support said grease hood at said opening and at least partially below the level of said ceiling whereby fumes may pass upwardly into said capture chamber.

4,141,343

HOT-WATER BOILER OF THE DIRECT-HEATING TYPE

Seiichi Awano, and Matsuo Nishimura, both of Tokyo, Japan, assignors to Seiichi Awano and Yasui Sangyo Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1977, Ser. No. 767,506
Claims priority, application Japan, Dec. 2, 1976, 51/143956
Int. Cl.[2] F24H *1/20*
U.S. Cl. 126—360 A 16 Claims

1. A hot-water boiler of the direct-hearing type comprising:

(a) a combustion chamber whose lower end is open,

(b) fuel supplying means for supplying combustion fuel into said combustion chamber,

(c) a heat-exchange chamber encircling the combustion chamber and adapted to contain water,

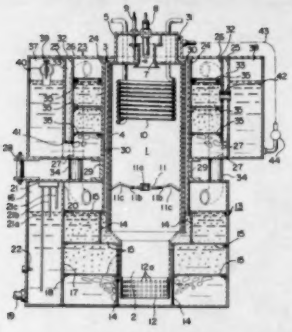
(d) water supplying means for supplying water into the heat exchange chamber at an upper portion thereof,

(e) water outlet means for withdrawing water after it has been heated in the heat-exchange chamber, from a lower portion thereof,

(f) gas outlet means for exhausting combustion products

from the heat-exchange chamber, located at an upper portion thereof,

(g) a plurality of substantially horizontally disposed gas-dividing plates spaced apart within said heat-exchange chamber, said plates adapted to break up into smaller bubbles the combustion gases discharged from the combustion chamber and rising through the heat-exchange



chamber, and further adapted to effect efficient heat exchange between the combustion gases rising and the water percolating downwards, and

(h) a hot-water storage tank where hot water discharged from the heat-exchange chamber is temporarily kept so that water-gas separation may be completed in the storage tank.

4,141,344

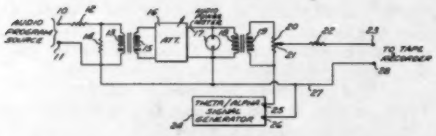
SOUND RECORDING SYSTEM

Louis J. Barbara, 7027 SW. 87 Ct., Miami, Fla. 33173

Filed Mar. 2, 1978, Ser. No. 882,777

Int. Cl.[2] A61M *21/00*

U.S. Cl. 128—1 C **9 Claims**



1. In a recording system for a sound recorder having an input, the combination of:

a signal generator for generating an A.C. signal of predetermined amplitude within the frequency range below about 14 Hz.;

means for combining additively with said A.C. signal an audio program signal falling substantially within a frequency range substantially above 14 Hz. and of substantially smaller amplitude than the maximum amplitude of said A.C. signal;

and means for applying the additively combined audio program signal and A.C. signal to the sound recorder input.

4,141,345

CERVICAL DILATION MEASUREMENT INSTRUMENTS

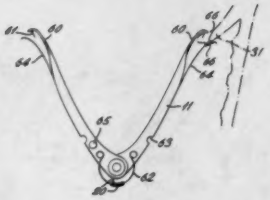
David W. Allen, Thornbury; John A. Richardson, Easter Compton, and Ian A. Sutherland, Harpenden, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 5, 1977, Ser. No. 756,836

Claims priority, application United Kingdom, Jan. 8, 1976, 00650/76

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—2 S **11 Claims**



1. A medical instrument comprising a pair of similar arms connected together adjacent one pair of respective ends to form a generally V-shaped caliper assembly for location in the vagina, a pair of connectors respectively mounted adjacent the other ends of said arms for securement to opposed portions of the cervix, a spring connected between said arms and acting to bias said arms for movement in mutually opposite directions, and an electropositional transducer coupled with said arms to provide a signal representing the relative positions of said arms and thereby cervical dilatation, said transducer including at least one strain gage mounted on said spring and having an electrical characteristic which varies with the stressed condition of said spring.

4,141,346

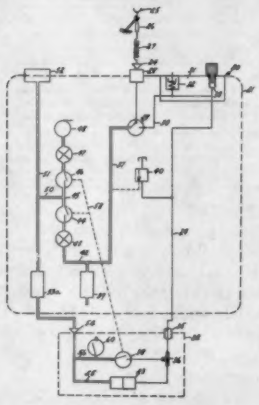
OCULAR PLETHYSMOGRAPH

Robert C. Dean, Jr., Norwich, Vt.; Paul A. Hoisington; Brian F. Walsh, both of Etna, N.H., and Frank E. Mastro, Lebanon, N.H., assignors to Life Sciences, Inc., Greenwich, Conn.

Filed Feb. 7, 1977, Ser. No. 766,058

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2 T **1 Claim**



1. An improved ocular plethysmograph comprising: a vacuum generating pump, a vacuum cup positionable in direct contact with the sclera of the eye, a flexible vacuum line interconnecting said cap and said pump, means for incrementally adjusting the degree of suction applied to said vacuum cup, a pneumatic DC transducer including a diaphragm, means for

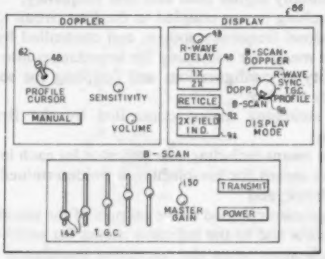
maintaining a reference vacuum pressure on one side of said diaphragm, means in series with said flexible vacuum line communicating with the other side of said diaphragm, whereby instantaneous pressure differentials existing between the sides of said diaphragm will cause a corresponding DC signal output from said transducer; automatically actuated pneumatic valve means for instantaneously shunting together said sides of said transducer upon manual adjustment of said vacuum adjustment means beyond predetermined limits; and linkage means interconnecting said first mentioned means and said pneumatic valve means, whereby the differential pressure existing on said transducer is constantly maintained between said predetermined limits.

4,141,347

REAL-TIME ULTRASONIC B-SCAN IMAGING AND DOPPLER PROFILE DISPLAY SYSTEM AND METHOD

Philip S. Green, Atherton; Louis F. Schaefer; Jon C. Taenzer, both of Palo Alto; John F. Holzemer, Mountain View; S. David Ramsey, Jr., Palo Alto, and Joe R. Suarez, Fremont, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 21, 1976, Ser. No. 725,178
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2 V **33 Claims**



20. Ultrasonic imaging and Doppler profile display means comprising,

pulsed B-scan ultrasonic imaging means including means for recurrently acquiring pulsed B-scan video line signals of a section within a body and visual display means for raster scan displaying the same,

pulsed Doppler ultrasonic means for acquiring a plurality of analog signals related to the Doppler frequency of signals from different depths along a line within the body, and

means for recurrently sequentially displaying said analog signals at said display means between selected video raster scanning lines of B-scan display for simultaneous real-time representation of said Doppler-related signals and said B-scan signals.

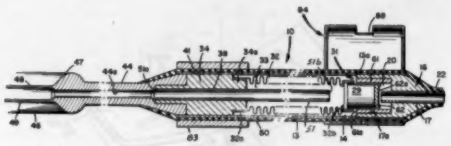
4,141,348

PRESSURE SENSOR APPARATUS FOR NON-INVASIVELY COMMUNICATING PRESSURE INSIDE A BODY TO THE EXTERIOR THEREOF

Fred Hittman, Baltimore, Md., assignor to Hittman Corporation, Columbia, Md.

Filed Sep. 27, 1976, Ser. No. 726,797
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—2 A **19 Claims**

1. A pressure sensor apparatus for indicating pressure in the body comprising a housing, a bellows contained within said housing wherein said bellows and said housing define a first chamber and a second chamber within said housing, means for placing said first chamber in communication with said pressure in the body so that said pressure will cause said bellows to move as a function of said pressure, means for placing said second chamber in communication with an ambient pressure comprising an ambient pressure sensing means for sensing ambient pressure and connecting means for connecting said ambient pressure sensing means with said second chamber, output means contained within said housing and associated with said bellows for producing an output which is a function of the movement of said bellows to a receiver means located external to said body to provide data indicative of said pressure and means for calibrating said apparatus in vivo by reproducing an output during in vivo calibration which is established during in vitro calibration comprising a stop means positioned



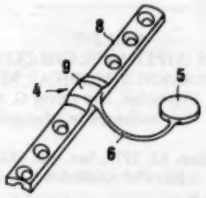
within said first chamber for limiting movement of said bellows to a predetermined position within said housing, said stop means extending through said housing having a first end at a predetermined position within said first chamber, and a second end outside the housing wherein said second end is in communication with said pressure in the body, wherein said bellows is adapted to move to said predetermined position when external pressure is provided to said ambient pressure sensing means.

4,141,349

PROCESS AND DEVICE FOR THE IN VIVO MEASUREMENT OF BONE CONSOLIDATION

Jean-Marie Ory, and Jacques Hummer, both of Nancy (Meurthe-et-Moselle), France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine (Hauts-de-Seine), France

Filed Nov. 3, 1976, Ser. No. 738,287
Claims priority, application France, Nov. 4, 1975, 75 33713
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—2 S **9 Claims**



6. Apparatus, which comprises:

means for detecting and measuring in vivo the degree of consoldiation of a fractured bone comprising means for transmitting an oscillating signal whose frequency of oscillation varies about a predetermined value in response to stress applied to said bone; said transmitting means including a power supply and a blocking oscillator having a transformer for detecting the stress applied to said bone and comprising a high permeability ferrite torus;

further comprising an osteosynthesis plate to which said ferrite torus is adhered, said plate adapted to be secured to said bone; and

means positioned in the vicinity of said transmitting means for receiving said oscillating signal.

4,141,350
VASCULAR SOUND DETECTOR

Masayuki Shinoda, Iwakura, Japan, assignor to Nippon Colin Co., Ltd., Nagaokakyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,122

Claims priority, application Japan, Dec. 3, 1975, 50-144815; Jun. 19, 1976, 51-072416

Int. Cl.[2] A61B 5/02

U.S. Cl. 128—2.05 S **4 Claims**

1. A vascular sound detector for insertion into a blood pressure measuring manchette, comprising a fairly flexible thin filmy wall having a thickness of between 0.3mm and 1.0mm and being made of Neoprene having a hardness of between JIS60 and JIS80 degrees, a relatively thick outer side shell of soft resilient deformable material having a peripheral outer wall of substantially rectangular shape connected to said filmy wall to define therebetween a hollow substantially rectangular space of constant depth and defining an enclosure which is flexible as a whole, at least one longitudinal straight elongated internal rib integrally formed on an intermediate portion of said outer side shell, with its ends spaced from said rectangular outer wall, for sustaining said hollow space without inhibiting longitudinal air movement therein, a condenser microphone communicatively connected to said hollow space, and means to reduce the pickup of extraneous noise without adversely affecting sound collecting, as well as to decompose a vascular sound distinctively according to different frequencies, said means comprising an element having a passage with a diameter between 0.2mm and 1.5mm extending to said hollow space and connecting said hollow space with the ambient atmosphere, whereby said hollow space is maintained as a unitary space and the sound sensing portion of said microphone is directly exposed to the inside of said hollow space.

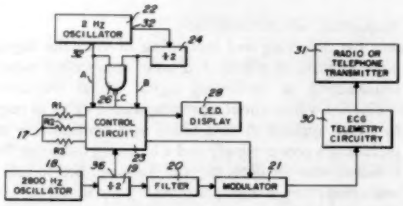
4,141,351
ECG ELECTRODE IMPEDANCE CHECKING SYSTEM AS FOR EMERGENCY MEDICAL SERVICE

Gordon W. James, Plantation, and David G. Storm, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1977, Ser. No. 832,320

Int. Cl.[2] A61B 5/04

U.S. Cl. 128—2.06 R **12 Claims**



1. A circuit for checking a plurality of impedances, the impedances having a common connection point, the circuit comprising in combination:

a first frequency source;

first circuit means coupled to the first frequency source for providing a plurality of switching control signals;

a second frequency source, said second frequency being at least fifty times said first frequency;

first switching means coupled to the first circuit means and the second frequency source and controlled by the first circuit means for switching the impedances into ones of a plurality of configurations and coupling the second frequency thereto;

second switching means coupled to and controlled by the first circuit means;

indicator means including one indicator for each impedance;

enabling means coupled to the outputs of the second switching means and to the indicator means and reference means for enabling one of the indicators when the respective impedance is greater than the predetermined value of impedance.

10. An electrode impedance checking circuit in an emergency medical radio apparatus, the circuit including in combination:

a first frequency source;

first circuit means coupled to the first frequency source for providing a plurality of switching control signals;

a second frequency source, said second frequency being substantially higher than said first frequency;

first switching means coupled to the first circuit means and the second frequency source, and controlled by the first circuit means for switching the impedances into ones of a plurality of configurations and coupling the second frequency thereto;

second switching means controlled by the first circuit means;

indicator means including one indicator for each impedance;

reference means for establishing a predetermined value of impedance; and

enabling means coupled to the outputs of the second switching means and to the indicator means for enabling one of the indicators when the respective impedance is greater than the predetermined value of impedance.

4,141,352
ORAL HYGIENE APPLIANCE

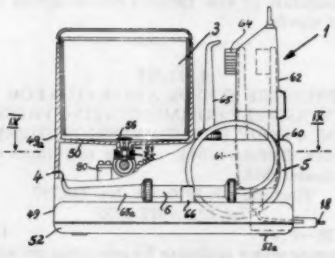
Albert Ebner, St. Georgen, and Kurt Bäuerle, Schramberg, both of Fed. Rep. of Germany, assignors to Kuno Moser GmbH, Roggenbachweg, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 727,689

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544534

Int. Cl.[2] A61H 9/00

U.S. Cl. 128—62 A **37 Claims**



1. In an oral hygiene appliance, a combination comprising a liquid reservoir; a nozzle; a pump having means for drawing liquid from said reservoir and for delivering spurts of liquid to said nozzle; prime mover means for driving said pump, said prime mover means comprising a multi-pole electromechanical oscillator including an oscillatory armature and means for connecting said poles to a source of alternating current; means for regulating the amplitude of oscillations of said armature;

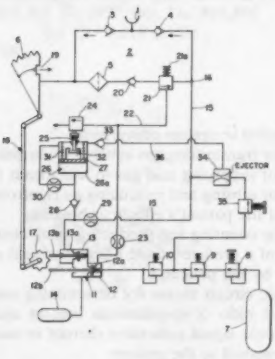
and shutoff valve means installed between said reservoir and said pump and having a valve element movable between open and closed positions, said regulating means comprising a device which is movable to and from a predetermined position in which said source is disconnected from said poles and means for moving said valve element to said closed position in response to movement of said device to said predetermined position.

4,141,353

WARNING ARRANGEMENT FOR BREATHING APPARATUS FOR DIVERS

Gunnar Dahlbäck, Stockholm, and Ivan A. Hellquist, Sollentuna, both of Sweden, assignors to AGA Aktiebolag, Sweden

Filed Nov. 8, 1977, Ser. No. 849,630
Claims priority, application Sweden, Nov. 9, 1976, 7612476
Int. Cl.[2] B63C *11/14, 11/20*
U.S. Cl. 128—142 R **7 Claims**



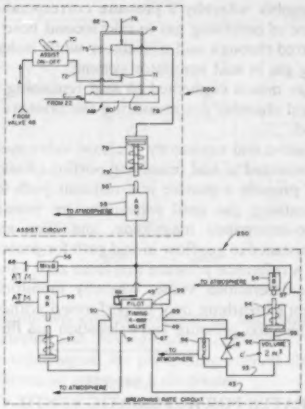
1. In an arrangement in a breathing apparatus for divers comprising a breathing circuit functioning as a closed circuit during a rebreathing phase, a source of breathing gas, a dosing bottle, dosing valve means, said source and said dosing bottle being operatively connected to said dosing valve means, a supply conduit operatively connected between said dosing valve means and said breathing circuit, wherein said dosing valve means alternately connects said dosing bottle to said source of breathing gas for filling the dosing bottle and to the breathing circuit so as to discharge the contents of the dosing bottle to the breathing circuit, said breathing circuit comprising non-return valve means for controlling the direction of flow in said circuit, an absorber containing a carbon dioxide absorbing substance, and a breathing bag, the improvement wherein the breathing circuit further comprises warning valve means, for in the closed state thereof, at least obstructing inhalation from the breathing bag and wherein a timing and pressure sensing control means is operatively connected to said supply conduit disposed between the dosing valve means and the breathing circuit, for, responsive to a sufficient pressure in said supply conduit due to the discharging of the dosing bottle, causing the warning valve means to assume an open state thereof and for maintaining said warning valve means in said open state during a predetermined time interval and for, responsive to an inadequate pressure in said supply conduit due to the discharging of the dosing bottle, causing the warning valve means to assume a closed state thereof whereby, inhalation from the breathing bag is obstructed and thereby, warning the diver of a low pressure in the breathing gas supply.

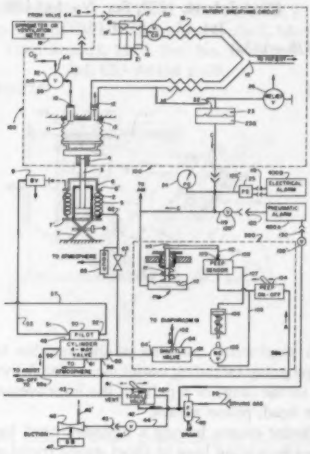
4,141,354

VENTILATOR SYSTEM FOR CONTROLLING, ASSISTING AND MONITORING A PATIENT'S BREATHING

Aaron Ismach, 200 Upper College Ter., Frederick, Md. 21701

Filed Mar. 4, 1977, Ser. No. 774,262
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.6 **9 Claims**





1. A ventilator system for controlling, assisting, and monitoring a patient's breathing, comprising:

independent sources of air and oxygen;

controllable breathing gas mixing means connected to said sources for mixing air and oxygen in a selected proportion to constitute a breathing gas mixture;

a first hose means connected at one end to said breathing gas mixing means;

a bellows means connected to the other end of said first hose means for receiving said fresh breathing gas;

a second hose means having a first end connected to said bellows means and a second end adapted to be connected to; said patient for conducting said breathing gas to said patient;

a third hose means having one end connected to said second hose means between said first and second ends of said second hose means for receiving an exhaled gas from said patient;

an exhaust means having one end connected to the other end of said third hose means for conducting said exhaled gas from said third hose means;

a direct pressure transducer comprising a sealed rigid chamber connected at one end to said second hose means between said bellows means and said third hose means, said rigid chamber having a diaphragm means for sealing one portion thereof from a remaining portion of said rigid chamber whereby a pressure corresponding to the pressure of breathing gas in said second hose means is transferred through said transducer while isolating the breathing gas in said ventilator system;

a gage means connected to said remaining portion of said rigid chamber for measuring the pressure in said system; and

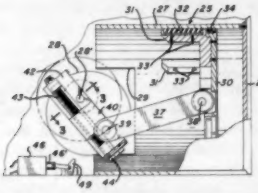
a positive end expiratory pressure valve means operatively connected to said remaining portion of said rigid chamber to provide a passive non-resistant path for said exhaled breathing gas until exhalation gas pressure drops to a pre-determined magnitude, and then applying infinite resistance to gas flow in said path for providing a true shift of a reference pressure axis from zero value, to a selected pre-determined value, whereby monitoring of said patient's breathing may be performed without distortion of exhalation pressure and exhalation gas flow.

4,141,355

APPARATUS FOR AUTOMATIC VENTILATION OF THE LUNGS

Wayne R. Apple, P.O. Box 3370, Boulder, Colo. 80303

Filed Jul. 14, 1977, Ser. No. 815,659
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.6 **3 Claims**



1. In a respiratory machine of the variable length stroke piston type pump including outlet means for delivering breathing fluid to the lungs of a patient, the improvement of

(a) thin head, piston means,

(b) cylinder means having a cylinder head for said piston means providing long to short stroke travel of said piston maintaining a closed pumping chamber,

(c) said cylinder having an extension wall opposite said cylinder head extending beyond maximum stroke of said thin head piston means, and provided with at least one cut-out in said extension,

(d) a plurality of brackets secured to said piston means about the peripheral edge thereof on the side opposite the pumping chamber arranged to reciprocably slide on the cylinder wall and providing support for said piston means in said cylinder, said brackets being spaced about said piston head coincident with said extension wall spaced from said at least one cut-out,

(e) motor means mounted to said cylinder means and extending through said cut-out, and

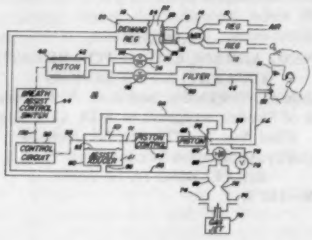
(f) linkage means connected between said piston means and motor means for reciprocably sliding said piston whereby, the motor means can be mounted closely to said cylinder head and still permit maximum travel of said piston means in said cylinder means.

4,141,356

RESPIRATOR SYSTEM AND METHOD

Paul R. Smargiassi, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Continuation of Ser. No. 696,677, Jun. 16, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,760
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **27 Claims**



1. A respirator system comprising:

means for transmitting gas suitable for breathing to a patient;

means for supplying said gas to said means for transmitting;

means for sensing and producing an electronic signal indicative of the patient's efforts to breathe;

means for counting and producing an electronic signal indicative of a predetermined number of said efforts to breath made by the patient;

electronic circuit means for determining and preselecting a desired ratio of spontaneous breaths and producing an electronic signal indicative thereof to assisted breaths to be furnished to the patient;

first means for providing said gas to said means for supplying at a pressure suitable for a spontaneous breath in response to said patient's efforts to breathe;

second means for providing said gas to said means for supplying at a pressure suitable for an assisted breath in response to said signal produced by said means for determining and preselecting a desired ratio of spontaneous breaths to assisted breaths to be furnished to the patient; and

means for preventing the superposition of an assisted breath upon a spontaneous breath.

4,141,357

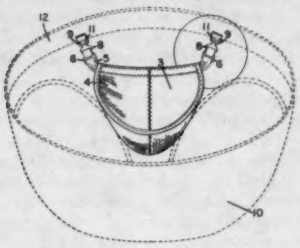
CUP SUPPORTER FOR INSERTION INTO A GARMENT

Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530

Continuation of Ser. No. 748,125, Dec. 6, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 858,393
Int. Cl.[2] A61F *5/40*
U.S. Cl. 128—159 **7 Claims**

1. A supporter comprising a cup-shaped hook pouch; said hook shaped pouch comprises non-circular flexible laminate sheet foam rubber and fabric, means of sewing adjacent edges of said non-circular flexible laminate to form a partial sphere, whereby said partial sphere is defined as a sphere cut by a second imaginary sphere whose center point is some distance from said partial sphere's center point forming a compartment curved to a hook shape; an elastic secured to top edge of said compartment curved to a hook shape, said elastic has its two ends extending outwardly, said two ends thread through two buckles to form two loops from said elastic said two ends, said two loops from said eleastic are threaded through two hooks

having means to accept said two loops from said elastic belt; bias tape secured to sides and bottom edges of said compartment curved to a hook shape; said two hooks accept two half circle loops attached to a garment by means of tapes, said tapes are fastened to said garment by means of sewing.



4,141,358

ANKLE TAPE PACK

Alexander H. DeMarco, 85 Maple Ave., Shelton, Conn. 06484

Filed Jul. 18, 1977, Ser. No. 816,594
Int. Cl.[2] A61F *13/06*
U.S. Cl. 128—166 **3 Claims**

1. An ankle tape pack, comprising a strap having inner and outer plies and being shaped for wear on an ankle and adjoining instep of a foot, and tapes attached with one end to said strap and adapted for winding on said strap when worn on an ankle and adjoining instep of a foot to thereby hold the ankle taped, with said inner ply being of sock material for direct wear on a wearer's skin, and said outer ply being stiffer than said inner ply for sufficient rigidity of said strap against self-folding upon itself, with said outer ply being of cured rubber to serve as a non-skid backing for the wound-on tapes to hold them against creepage on said strap.

4,141,359

EPIDERMAL IONTOPHORESIS DEVICE

Stephen C. Jacobsen; Robert L. Stephen; R. Todd Johnson; Richard Luntz, and David Knutti, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Aug. 16, 1976, Ser. No. 714,942
Int. Cl.[2] A61N *1/30*
U.S. Cl. 128—172.1 **9 Claims**

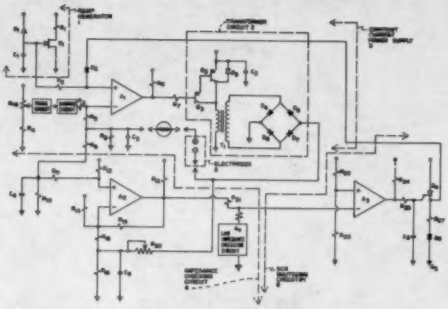
1. An iontophoresis device for epidermal application, comprising:

a. a constant current source;

b. applicator and grounding electrodes for emplacement upon patient tissue to provide a current path therethrough for performing iontophoresis upon a portion of said tissue;

c. means for electrically connecting said current source to said electrodes to thereby produce a voltage differential across said electrodes;

d. an impedance checking circuit coupled to said electrodes and having means for setting predetermined limits of impedance as measured across said electrodes which mark the bounds of safe operation for said device, said impedance checking circuit also having means to signal the occurrence of impedance values outside these predetermined limits;



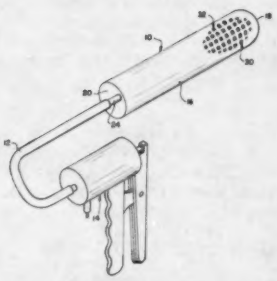
e. a safety-shutdown circuit coupled to said impedance checking circuit and having means responsive to said impedance value signal for preventing current flow and voltage differential across said electrodes.

4,141,360

MENSTRUAL EXTRACTION DEVICE

Tull C. Lasswell, 626 Oxford Oaks Ct., Oxford, Mich. 48051

Filed Jan. 31, 1977, Ser. No. 764,419
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—276 **25 Claims**

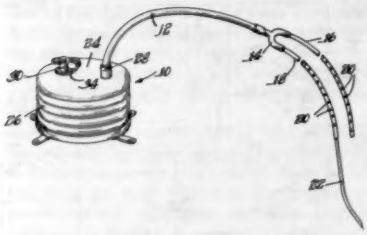


1. A vaginal suction device comprising an elongated chamber-defining tubular hollow member for introduction into the vagina and having a substantially cylindrical non-collapsible body portion, a rounded imperforate front end wall for abutting the posterior wall of the vagina vault closing an end of said body portion, a rear end wall closing the other end of said body portion, said other end of said body portion normally projecting to the exterior of the vagina, a screened opening formed in a side of said body portion proximate said front end wall, said screened opening being engageable with the cervix of the uterus, a passageway in said rear end wall communicating with said chamber, coupling means connecting said passageway to a source of partial vacuum suctioning the contents of said uterus in said chamber, and orientation indicating means at said other end of the body portion for registering said screened opening with the cervix of the uterus, said orientation indicating means comprising said passageway and coupling means disposed proximate an edge of said rear end wall corresponding to the positioning of said screened opening in engagement with the cervix of the uterus.

4,141,361
EVACUATOR

Harold I. Snyder, Dover, Ohio, assignor to Snyder Manufacturing Co., Incorporated, New Philadelphia, Ohio

Continuation-in-part of Ser. No. 9,610, Feb. 9, 1970, abandoned.
This application May 17, 1972, Ser. No. 254,080
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—278 26 Claims

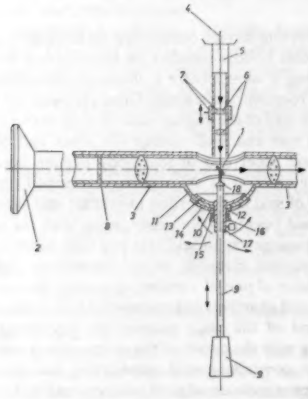


1. A self-contained, independently operable, evacuator for the extraction of body fluids, for ambulatory human use, said evacuator comprising in combination, a container, a resilient diaphragm formed as a movable end wall of said container with its outer face open to atmosphere, said diaphragm having a normal position which it tends to assume by reason of its resiliency across one end of the container and being operable upon the manual actuation thereof to a stretched negative pressure applying position within the container confines and toward the opposite end thereof with the outer face of the diaphragm remaining open to atmosphere during this movement, said container being provided with an opening into which a conduit of flexing tubing may be connected, the other end of said tubing being of a material compatible with human tissue and being arranged for insertion into a body wound, whereby as said diaphragm returns to normal position across the said one end of the container the negative pressure applied by the diaphragm within the container will effect the extraction of body fluids from the wound by continuous suction, said fluids being thereby expressed into the container for storage therein.

4,141,362
LASER ENDOSCOPE

Helmut Wurster, Oberderdingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,385
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 9 Claims

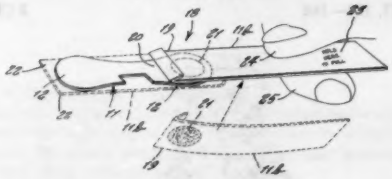


1. A combined optic endoscope and surgical Laser attachment comprising, an elongated shaft of a size for body tissue endoscopy; containing a single lens relay system including an objective lens for directing to the operation site a Laser beam while allowing simultaneous observation of the operating site through the same lens system, a Laser beam transmitting lens system positioned on said shaft and attached thereto, a manually tiltable Laser beam deflection mirror permeable to visible light located at one end of and on the axis of each of the lens relay system and transmitting lens system, said mirror being in position to receive and deflect to said lens relay system including the objective lens; the transmitted Laser beam, and an optic observation lens and related ocular on said shaft on the axis of said mirror and lens relay system and located on the side of said mirror opposite said lens relay system allowing the surgeon to observe the operation site, so that by tilting said mirror the Laser beam may be directed to any spot within the optic observation field.

4,141,363
INTERLOCKING SUTURE

Jesse L. James, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Nov. 20, 1975, Ser. No. 633,849
Int. Cl.[2] A61B *17/04*
U.S. Cl. 128—335 1 Claim



1. An interlocking tape suture, comprising a flexible, thin material having pressure sensitive adhesive applied on one entire side thereof and covered by a glossy paper that is peelable away from said adhesive, said tape being of elongated shape having similar wider, rounded opposite ends and a tapering narrower width longitudinal central portion formed by inwardly tapering opposite longitudinal spaced side edges, wherein one said side edge having a rectangular notch at said center, the depth of said notch being one-half the width of said narrower longitudinal central portion, wherein said peelable glossy paper is substantially longer than said tape on one end, said longer end of said paper being folded over around an opposite side of an adjacent end of said tape, and secured there to wherein said glossy paper includes extending tab portions on its opposite end so to be readily grasped for being peeled from said tape and wherein a small spot of pressure sensitive adhesive is applied upon said tape opposite side adjacent end, and said folded over glossy paper end being engaged by said adhesive spot.

4,141,364
EXPANDABLE ENDOTRACHEAL OR URETHRAL TUBE

Jorge Schultze, 2550 Morgan Ave., Corpus Christi, Tex. 78405

Filed Mar. 18, 1977, Ser. No. 779,068
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B 4 Claims

1. A tube which may be collapsed for insertion of a first end into a body passage and then expanded for transporting a fluid, comprising

an elongate conduit, open at each end, providing an intermediate section between the ends having thin inner and outer walls defining an annulus therebetween closed at the first tube end, the conduit being expandable from a collapsed configuration to a distended configuration in response to the introduction of fluid into the annulus;

means at least partially rigidifying the conduit in the collapsed configuration thereof comprising a plurality of generally parallel pleats in the inner and outer walls extending from adjacent from adjacent the first conduit end toward the second conduit end providing spaced transversely corrugated inner and outer walls; means for delivering fluid to the annulus; and

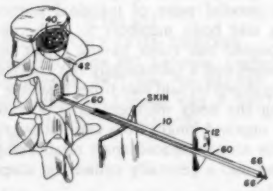
an expandible cuff on the exterior of the tube for expansion into sealing engagement between the tube exterior and the interior of the body passage.

4,141,365

EPIDURAL LEAD ELECTRODE AND INSERTION NEEDLE

Robert E. Fischell, Silver Spring, and William R. Powell, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 24, 1977, Ser. No. 771,442
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—404 **16 Claims**



1. Apparatus for effecting electrical contact between tissue internal of a living body and a source of electrical stimulation energy, comprising:

rigid sleeve means, forming a longitudinally disposed lumen, for penetrating tissues of said living body to position said apparatus in proximity to selected internal tissue, said sleeve means having a longitudinal slot disposed therein and extending along the length thereof, said slot being in communication with said lumen:

flexible electrically conductive lead means dimensioned so as to be longitudinally slidable through said lumen formed by said sleeve means, said lead means including an elongated body portion formed of a flexible physiologically inert dielectric material, said body portion being substantially oblong in cross-section and having flattened upper and lower surface portions; and

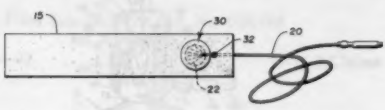
electrode means electrically connected to and carried on a first end of said lead means and adapted to be connected electrically through said lead means to the source of electrical stimulation energy, said electrode means being disposed on one of said flattened surface portions of said substantially oblong body portion.

4,141,366

LEAD CONNECTOR FOR TAPE ELECTRODE

Thomas E. Cross, Jr., Brooklyn Park, and Douglas R. Gray, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 18, 1977, Ser. No. 852,849
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—418 **17 Claims**



1. A tape electrode for adhesion to the skin, comprising:

a porous substrate;

a layer of conductive material and an adhesive matrix carried on one side of said substrate;

lead means contacting said conductive layer for connecting said conductive layer to an electrical apparatus; and

cover means of a substantially flat shape and having two sides, at least one of which is coated with conductive material, said cover means being positioned on said conductive material layer of said substrate so that said lead means is between said cover means and said layer of conductive material on said substrate with the coated side of the cover means member disposed away from the lead means.

4,141,367

CARDIAC ELECTRODE/PACER SYSTEM ANALYZER

Lloyd A. Ferreira, Williamsville, N.Y., assignor to Med Telectronics Ltd., Suffield, Conn.

Filed Apr. 29, 1977, Ser. No. 792,404
Int. Cl.[2] A61N 1/32
U.S. Cl. 128—419 PT **32 Claims**

32. An electrode/pacer system analyzer for use when implanting and testing cardiac pacers and electrodes which displays any of a plurality of measurements selectively on a digital display which comprises: digital display means; means for connection to an external pacer to be implanted; means for connection to a cardiac electrode; pacer analyzing means for measuring and controlling the display of the characteristics of a connected external pacer, including a plurality of measuring circuits for selectively measuring different characteristics of a connected external pacer and means for controlling the display on said digital display of the measurement values; an internal pacer, useful for threshold analysis and for maintaining patient heartbeat, which includes means for adjusting internal pacer impulse characteristics, means for measuring characteristics of the pacer impulses, and means for controlling the display on said digital display of the measurement values; and switch means for selectively connecting a connected cardiac electrode to said internal pacer and to a connected external pacer.

4,141,368

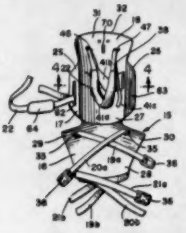
TEMPORARY CERVICAL IMMOBILIZING ORTHOSIS

Paul R. Meyer, Chicago, Ill., assignor to Northwestern University, Evanston, Ill.

Filed May 23, 1977, Ser. No. 799,592
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—87 B **9 Claims**

1. A device for immobilizing the cervical spine and cranium of a patient comprising an orthosis having a shoulder portion adapted to conform generally to the back of the shoulders of a patient, a generally V-shaped head portion having a lower end joined to the shoulder portion and an upper end, and a top portion extending across the upper end of the V-shaped head portion, a strap attached to the shoulder portion for strapping the orthosis to a patient so that the shoulder portion engages

the shoulders of the patient and the inside of the V-shaped head portion engages the head of the patient and the top portion is spaced above the head of the patient, a pair of clips mounted on the outside of the V-shaped head portion on opposite sides thereof, a pair of elastic straps, each of the elastic straps having a first end portion secured to the outside of the V-shaped head portion, a looped intermediate portion extending through an



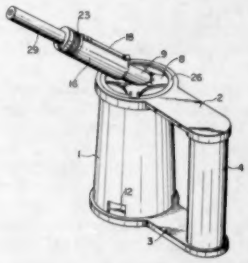
opening in the top portion, and a second end portion extending through one of the clips, and a halter adapted to engage the head of the patient, the halter including a ring for each of the elastic straps through which the looped intermediate portion of the strap extends whereby tension on the elastic straps and the halter can be adjusted by pulling the second end portions of the straps through the clips.

4,141,369

NONCOMBUSTION SYSTEM FOR THE UTILIZATION OF TOBACCO AND OTHER SMOKING MATERIALS

Robert P. Burruss, 6433 79th St., Cabin John, Md. 20731

Filed Jan. 24, 1977, Ser. No. 761,794
Int. Cl.[2] A24F *1/00*
U.S. Cl. 131—171 A **5 Claims**



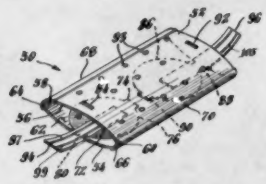
1. In an arrangement for utilizing tobacco and the like smoking materials without effecting combustion thereof, a side and bottom wall means defining a casing, said side wall means having openings therein adjacent the bottom wall means, a tubular chamber suspended within said casing and supported by said casing, said chamber being open at its lower end, heating means within said chamber for imparting heat to air entering the same through said openings and said open lower end, a tubular conduit in communication with the upper end of said chamber, a tubular mouthpiece means, an apertured tubular smoking material container removably arranged within one end of said mouthpiece means and having a length such as to protrude therefrom, said container being dimensioned such as to telescopically fit within said tubular conduit whereby to communicate air heated in the aforementioned chamber through said container to the mouth and respiratory passages of the user by way of the mouthpiece-contained smoking material; the heat energy in the heated air being imparted by convective and conductive transfer mechanisms to the smoking material wherefrom the volatile ingredients are evaporated away from the nonvolatile cellulosic components of the smoking material and are thence carried as a vapor in the heated air stream to the mouth and respiratory passages of the user.

4,141,370

HAIR ROLLER

David L. Haas, Norwalk, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Nov. 15, 1976, Ser. No. 741,611
Int. Cl.[2] A45D *2/02*
U.S. Cl. 132—39 **10 Claims**



1. A hair roller resiliently expandable from a substantially flat storage configuration into an elongated generally cylindrical-shaped body which is substantially resistant to bending and buckling to externally applied finger force when readied for use, said hair roller comprising;

a. two resiliently flexible rectangular shaped substantially flat body members having a width and substantially the same length,

b. each of said body members having laterally opposed longitudinal marginal portions terminating in longitudinal edges, said body members being arranged in a substantially flat overlying relationship to each other with said opposed marginal portions of each body member arranged in an aligned co-extensive relationship forming adjacent parallel pairs of marginal portions,

c. means secured to each of said body members adjacent said longitudinal edges in bridging relationship to each of said adjacent parallel pairs of marginal portions for hinge coupling said body members to each other forming a hinge coupled hair roller having a pair of laterally opposed hinges and a substantially flat configuration,

d. means arranged on said hair roller operable for resiliently deflecting the body members in cooperation with said laterally opposed hinges from said flat overlying relationship to an arcuate spaced apart relationship to form the hair roller into a generally cylindrical shaped configuration,

e. means secured to said deflecting means and releasably engageable with one of said body members for maintaining said hair roller in said deflected cylindrical configuration, and

f. the resiliency of said body members in cooperation with said laterally opposed hinges urging said hair roller to automatically assume said substantially flat configuration upon release of said maintaining means from said one of the body members.

4,141,371

HAIR ROLLER

Robert B. Gangnath, Monroe, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

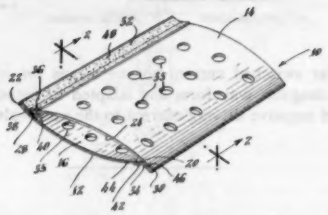
Filed Nov. 15, 1976, Ser. No. 741,923
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—40 **5 Claims**

1. A hair roller resiliently expandable from a substantially flat storage configuration into an elongated cylindrical shaped configuration which is substantially resistant to bending and buckling to externally applied finger force when readied for use, said hair roller comprising in combination,

a. a pair of resiliently flexible rectangular-shaped substan-

tially flat body members having substantially the same length and width arranged in a laterally offset substantially flat overlying relationship to each other,

b. each of said body members having opposed corresponding elongated marginal portions terminating in longitudinally extending edges, said marginal portions being arranged in a laterally offset relationship to each other with said marginal portions being arranged in adjacent parallel pairs, one of the longitudinal edges within each of said adjacent pairs being laterally offset with respect to the other longitudinal edge of said adjacent pairs forming a pair of laterally opposed offset longitudinal edges,



c. means secured to each of said offset marginal portions in bridging relationship to each of said laterally recessed longitudinal edges of each of said adjacent pairs for hinge coupling said body members to each other along said laterally offset marginal portions forming a hinge coupled hair roller having a pair of laterally opposed hinges and a substantially flat storage configuration, said hinge coupled body members being resiliently deflectable from said substantially flat overlying relationship to an arcuate shaped spaced apart relationship to form a hair roller having a generally cylindrical-shaped configuration, and

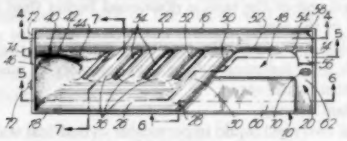
d. means arranged on said hinge coupling means for maintaining said hair roller in said deflected cylindrical shaped configuration.

4,141,372

VIBRATORY COIN FEEDER

Ronald C. Gdanski, P.O. Box 307, Grimsby, Ontario, Canada

Filed Dec. 19, 1977, Ser. No. 862,187
Claims priority, application Canada, Oct. 5, 1977, 288200
Int. Cl.[2] G07D *9/00*
U.S. Cl. 133—1 R **16 Claims**



1. A feeder for disc-like objects comprising

(a) a generally box-like structure having opposed side and end walls and a bottom wall;

(b) said bottom wall defining:

(i) a first flow path extending the length of said structure and terminating adjacent one end wall at an opening in said bottom wall;

(ii) a second flow path having a first portion parallel to said first path and auxiliary portions linking said first portion to said first path, said first portion being raised relative to said first path and said auxiliary portions being angled forwardly relative to said first portion;

(iii) each of said paths having an upper surface contoured so that the smallest object to be fed will not lie flat thereon; and

(iv) a raised area adjacent the other end wall between said first path and said first portion, said area defining flow routes towards each of said flow paths; and

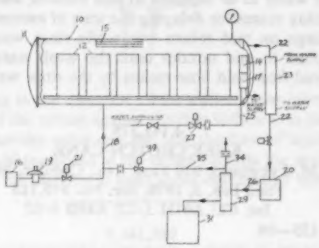
(c) means for imparting vibrations to said structure.

4,141,373

METHOD FOR DEOILING METAL SCRAP

John M. Kartanson, and Robert M. Neel, both of Winston-Salem, N.C., assignors to RJR Archer, Inc., Winston-Salem, N.C.

Filed Sep. 28, 1977, Ser. No. 838,789
Int. Cl.[2] B08B *5/04*
U.S. Cl. 134—21 **8 Claims**



1. A method of removing oil from metal scrap, comprising the steps of:

(a) introducing an oil laden scrap into a hermetically sealable chamber;

(b) evacuating said chamber;

(c) introducing an inert gas into said chamber after evacuation to flush the chamber of air;

(d) heating said inert gas within said chamber until the scrap metal is raised to a selected temperature;

(e) reducing the pressure in said chamber after the metal has obtained the selected temperature by withdrawing the chamber atmosphere which includes a mixture of inert gas and vaporized oil; and

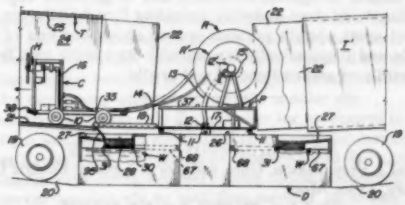
(f) continuously introducing the inert gas into the chamber as the atmosphere within the chamber is being withdrawn.

4,141,374

TRAILER WASHING APPARATUS

Richard C. McMahan, La Salle, Colo., assignor to Wash Wagon Corporation, Lakewood, Colo.

Continuation of Ser. No. 696,647, Jun. 16, 1976, abandoned.
This application Apr. 6, 1977, Ser. No. 785,196
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[2] B08B *3/02, 9/00*
U.S. Cl. 134—46 **5 Claims**



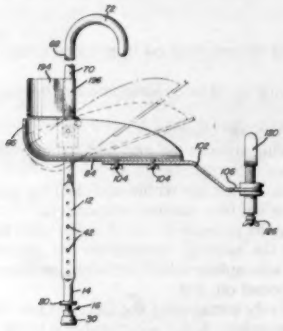
1. Apparatus for washing an interior space of a trailer and the like, comprising:

a carriage having wheels and drive means for moving said carriage inwardly from the rear to the front of the trailer space and outwardly from the front to the rear thereof;

a series of nozzles mounted on said carriage for spraying wash water and rinse water against the walls and ceiling of

said trailer space during inward and outward movement of said carriage;
means for storing a supply of heated, soapy wash water;
means for supplying said wash water to said carriage nozzles, including hose means extending to said carriage and a pump for pumping said wash water through said hose;
means for storing a supply of rinse water;
means for supplying rinse water to said carriage nozzles through said hose means during the return trip;
control means for starting said carriage on its inward trip and for stopping said carriage on reaching the inner front wall of said space;
means for starting said carriage on its return trip and causing rinse water to be supplied to said nozzles; and
time delay means for delaying the start of movement of said carriage on said return trip while rinse water is being supplied to said nozzles until the wash water has been cleared from said hose means by the rinse water.

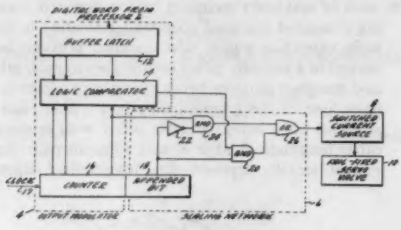
4,141,375
KNEE CRUTCH-CANE
Leonard M. Tykwinski, 910 First Ave., Cadillac, Mich. 49601
Filed Feb. 3, 1978, Ser. No. 875,113
Int. Cl.[2] A61H *3/02*; A45B *9/02*
U.S. Cl. 135—66 **29 Claims**



1. A crutch cane including an upright having upper and lower ends, the lower end of said upright including end means for frictionally engaging an upwardly facing support surface, an upwardly opening knee and lower leg receiving cradle support from said upright spaced above said lower end, the upper end of said upright including a horizontal hand grip, said cradle defining an elongated generally horizontal upwardly opening trough, one end of said cradle including an outwardly convex end wall closing the corresponding end of said trough, wherein said upright including horizontal spaced apart upright portions between which said cradle is disposed, and an adjustable length, elongated, horizontal and longitudinal edge upstanding wide strap assembly extending loosely between said spaced apart upright portions spaced above one end of said cradle and longitudinally bowed with its convex side facing outwardly of said one end of said cradle.

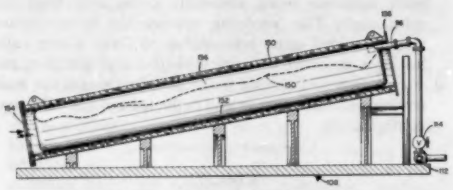
4,141,376
DIGITAL SERVOVALVE DRIVE
Daniel J. Frey, Mason, Ohio, assignor to General Electric Company, Lynn, Mass.
Filed Jun. 29, 1977, Ser. No. 812,029
Int. Cl.[2] F15B *5/00*; F16P *5/00*; G05D *16/20*
U.S. Cl. 137—83 **9 Claims**

1. A circuit for generating a driving current for a servovalve in response to a received digital word comprising:
output modulator means for receiving the digital word and outputing a fixed frequency rectangular waveform which transitions between low and high and which has a duty cycle proportional to the magnitude of the digital word; and



bipolar switched current source means for receiving the rectangular waveform and adapted to output a positive and negative driving current to the servovalve.

4,141,377
UNDERWATER STORAGE ASSEMBLY
Ramon J. Fernandez, and John S. Kahl, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.
Filed Aug. 30, 1976, Ser. No. 718,981
Int. Cl.[2] B65G *5/00*
U.S. Cl. 137—236 **6 Claims**



1. An environmentally safe underwater storage assembly for storing liquids at temperatures above the freezing point of water comprising
at least one cylindrical storage tank,
a skid assembly for maintaining each tank in position so that a first end of the tank is positioned higher than a second end of the tank,
said skid including pile receiving means for engagement with piles for securing the skid assembly in place at the bottom of the sea,
each tank having
at least two rigid liquid impermeable cylindrical walls defining an inner chamber, said cylindrical walls comprising an inner wall having a corrugated steel structure and an outer wall disposed contiguously with said inner wall, said outer wall comprising concrete,
a flexible liquid impermeable membrane secured to the inside of said inner wall for dividing the inner chamber into a first and a second compartment,
a passage at said second end for allowing water to pass freely into and from said first compartment from the environment,
a filtering apparatus associated with each tank for preventing debris and sea organisms from entering the tank through the respective passage, and
at said first end, means for receiving liquids into and discharging liquids from said second compartment, said second compartment being capable of storing said liquids and said second compartment being liquid-tight.

4,141,378

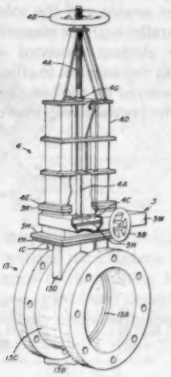
PRESSURE PIPELINE STRUCTURE AND METHOD

John W. Wegner, Du Page County, and Herbert L. Porter, Clarendon Hills, both of Ill., assignors to Advance Valve Installations Inc., Hinsdale, Ill.

Continuation-in-part of Ser. No. 596,971, Jul. 17, 1975, abandoned. This application Jan. 9, 1977, Ser. No. 647,917

Int. Cl.[2] F16K *43/00*

U.S. Cl. 137—315 7 Claims



1. A fluid system including a fitting having a flow-through passageway therethrough and an opening in the wall thereof for moving a desired member into and out of the fitting while the fitting is a part of the system, said fitting having a first mating surface for receiving apparatus for manipulating such member into or out of position, which mating surface surrounds said opening, in combination with a structure for facilitating making changes within the fitting while the fitting is part of the system and without closing down of the system, said structure including an operating mechanism and joining means adapted to be interposed between the operating mechanism and the fitting, the joining means including a pass-thru gate, means for releasably connecting the joining means to and between the fitting and the operating mechanism, said joining means having a joining mating surface cooperating with said first mating surface to produce a fluid-tight seal between the fitting and the joining means around said opening, the fitting having at least one thru-hole, extending therethrough and located between the opening in the wall of the fitting and the inner periphery of said fluid-tight seal, a closure member for said opening in the wall of the fitting, said closure member having at least one hold-down fastener passing through said thru-hole and retaining the closure member to the fitting, and a means for establishing removable fluid-tight closure closing the thru-hole.

4,141,379

CHECK VALVE

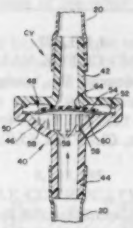
Reinhold R. Manske, Hayward, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed May 16, 1977, Ser. No. 796,923

Int. Cl.[2] F16K *15/14*

U.S. Cl. 137—496 6 Claims

1. A check valve in a system for administering parenteral solutions comprising an elongated hollow housing having an enlarged portion between an inlet and an outlet, a thin flexible screen sealed peripherally within the enlarged portion and lying transversely to the inlet, means for supporting the screen, the support means being located in that part of the enlarged portion adjacent the outlet, a valve seat adjacent the passage at the inner end of the inlet, a thin resilient impervious disc separate from the screen and lying between the screen and the valve seat and adapted for releasably sealing the passage of the inlet, the screen and the disc being spaced from the valve seat with the screen being in an unflexed condition when the valve is in its normally open position whereby liquid flowing in the direction of the inlet to the outlet will pass freely around the disc and through at least a portion of the screen, whereas liquid



when flowing in the direction of the outlet to the inlet effects movement of the screen against the disc sufficient to cause the disc to contact the valve seat and stop the flow of liquid when the pressure of the liquid at the outlet exceeds the pressure of the liquid at the inlet by at least about one inch of water.

4,141,380

FLOW-LIMITING DEVICE FOR A PIPE CARRYING A FLUID OR GASEOUS MEDIUM

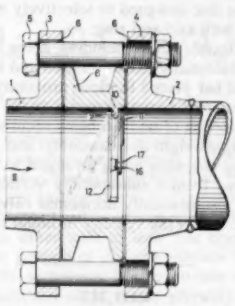
Arthur Lenk, Essen-Borbeck, Fed. Rep. of Germany Germany, assignor to STEAG Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Nov. 29, 1976, Ser. No. 745,970

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553775

Int. Cl.[2] F16K *15/03*

U.S. Cl. 137—513.5 4 Claims



1. A flow limiting device for a pipe carrying a fluid or gaseous medium, said medium flowing in a first direction, comprising:

a housing having a bore therethrough; an annular rib extending part way around the circumference of said bore, said annular rib further extending radially into said bore;

a flap member mounted in said bore adjacent said annular rib for movement with respect to said annular rib;

means for mounting said flap member for movement in said bore, said mounting means connecting said flap member to said annular rib, said means for mounting said flap member further comprising resilient biasing means connecting said partial annular rib to said flap member such that said resilient means urges said flap member in a direction opposite said first direction of flow and thereby increase said cross-sectional area of flow through the pipe in dependence on the kinetic energy differential of the medium upstream and downstream of the flap member; and

said flap member further being shaped to have a space between said flap member and the internal wall of the bore

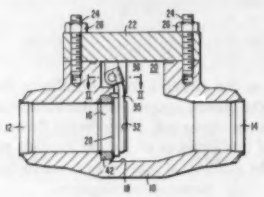
which together with that portion of the circumference of the bore not having an annular rib portion defines a passage to provide flow through the pipe when the flap member is positioned to provide a minimum cross-section area of flow through the pipe.

4,141,381

SWING CHECK VALVE

Harry E. Eminger, Valencia, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1976, Ser. No. 731,389
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—527.2 **5 Claims**



1. A swing check valve for facilitating flow of liquid in a forward direction while precluding reverse flow through the valve comprising:

a valve body having an inlet and an outlet;

a recessed portion in the central part of said valve of a size sufficient to accept a sealing ring which is welded therein;

a lightweight swing check valve disc assembly mounted in said valve body;

said check valve disc assembly including mounting means on one end thereof removably mounted in the valve body;

spaced flexible arms interconnecting said mounting means with a valve disc designed to selectively engage and provide a seal with said seal ring;

said spaced flexible arms including a bar of spring steel which is substantially closed on itself and has the two arm ends of said bar placed in close proximity to each other and fitted into said mounting means on the valve body, the remaining portion of said bar being secured to said disc to provide a lightweight disc assembly; and

said valve disc assembly being arranged to swing into said recessed area from a substantially vertical closed valve position to a substantially horizontal valve open position when subjected to the velocity of liquid flowing through said valve.

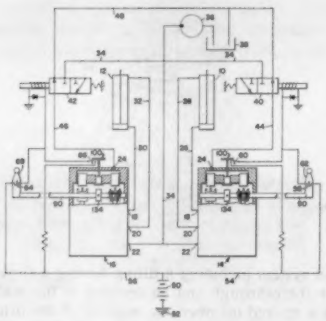
4,141,382

CONTROLS FOR ACTUATING A DIRECTION CONTROL VALVE TO AND RELEASING IT FROM A FLOAT-EFFECTING CONDITION

James A. Miller, and William L. Snyder, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 3, 1977, Ser. No. 848,264
Int. Cl.[2] F15B *13/043, 13/08*
U.S. Cl. 137—596.15 **6 Claims**

1. In a direction control valve and control system therefor wherein the direction control valve includes first and second independently shiftable elements respectively shiftable from neutral positions to actuated positions for effecting first and second flow directions through the valve, a manually-operated actuating member connected to the first element and movable between neutral and first positions for moving the first element between its neutral and actuated positions, pressure-responsive actuating means pressurizable and mounted for moving the second element from its neutral to its actuated position, a fluid circuit for selectively pressurizing the pressure-responsive actuating means including a pressure source, a sump and a solenoid-operated valve connected to the pressure-responsive actuating means, the pressure source and the sump and being movable between an unactuated and an actuated position respectively wherein it connects the pressure-responsive actuating means to the sump and to the source of pressure; and an electrical circuit for selectively energizing the solenoid-operated valve including an electrical current source, a normally open manually operated switch connected in series with and between the current source and the solenoid-operated valve, the improvement comprising: said circuit including a second normally open switch connected in series with and between the current source and the solenoid-operated valve and connected in parallel with the manually-operated switch; a pressure-responsive element mounted adjacent the second switch for movement thereagainst to effect closing of the latter when pressure is received by the last-named element; conduit means connecting the pressure-responsive element to the pressure-operated actuating means for causing the pressure-responsive element to move to effect closing of the second switch anytime the actuating means is pressurized; and motion transfer means connected to the manually-operated actuating member for effecting movement of the pressure responsive element away from the second switch to effect opening of the latter when the manually-operated actuating member is moved toward its first position, whereby, once the manually operated switch is closed to energize the solenoid-operated valve so as to effect pressurization of the pressure-operated actuating means and thus to effect the second flow direction through the direction control valve, the manually operated switch may be released and the second flow direction through the direction control valve will be maintained until the manually operated actuating member is moved to effect the first flow direction through the direction control valve.



4,141,383

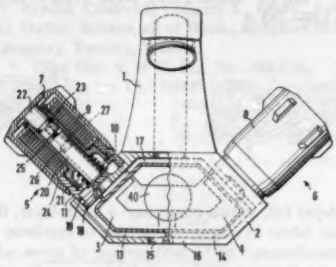
OUTLET FIXTURE FOR FLUID MEDIA

Josef Geimer, Drunen, Netherlands, assignor to Turke & Bolte, Summern, Fed. Rep. of Germany

Filed Sep. 10, 1976, Ser. No. 721,964
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—606 **1 Claim**

1. In an outlet fixture for mixing and discharging two fluid media, such as hot and cold water, of the type wherein the discharge of the media is controlled by an electronic circuit having an antenna which cooperates with magnetic valve means which is operated when the hand or similar object is brought into proximity with said antenna, the improvement comprising a base portion including a mixing chamber for the fluid media, two media supply pipes for supplying the respective fluids to the mixing chamber, two magnetic valves for controlling the flow of fluids to the mixing chamber connected to said base portion, a single discharge means connected to the base portion to receive the mixed fluids from the mixing chamber and discharge same from the front side of the fixture, said base portion also including said electronic circuit and its associated antenna, said antenna being positioned in the front side of

the base portion, a pair of hand operable rotatable knobs, one for each of said magnetic valves, said knobs being manually adjustable for establishing the maximum of flow through the respective valves, at least one of said magnetic valves comprising a shifting bolt and a magnetic impact bolt, an engaging



piece fastened on the magnetic impact bolt extending between the magnetic shifting bolt and the magnetic impact bolt, shoulder means on the interior of the shifting bolt, said engaging piece having a head lying against said shoulder means whereby said valve may be manually operated in the event of a power failure.

4,141,384

WATER TAPS

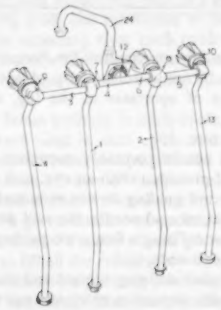
Jan G. H. Zijlstra, Auckland, New Zealand, assignor to AHI Operations Limited, Auckland, New Zealand

Continuation of Ser. No. 722,295, Sep. 10, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,406

Claims priority, application New Zealand, Sep. 23, 1975, 178763

Int. Cl.[2] F16K *11/20*

U.S. Cl. 137—883 **6 Claims**



1. A tap assembly comprising:

a pair of first control members for liquid flow, each first control member including a unitary valve body defining therewithin first and second chambers and a liquid path between said chambers, and also defining an inlet to said first chamber and one outlet from each chamber, and each first control member also including a valve member movable to close said liquid path between said chambers without substantially affecting liquid flow between said inlet to said first chamber and said outlet from said first chamber, said inlet and each of said outlets having respective axes, the axes of said outlets being substantially parallel to each other and the axis of said inlet being substantially at right angles to the axes of said outlets;

a pair of second control members for liquid flow, each second control member including a unitary valve body defining an inlet and an outlet having respective axes which are substantially at right angles to each other;

a first pipe connecting the outlet of one of said first chambers to the inlet of one of said second control members;

a second pipe connecting the outlet of the other of said first chambers to the inlet of the other of said second control members; and

a T intersection pipe having a cross member with two opposite ends, said two opposite ends being connected respectively to the outlets of said second chambers,

said control members being located along substantially the same line.

4,141,385

FLEXIBLE CORRUGATED TUBE

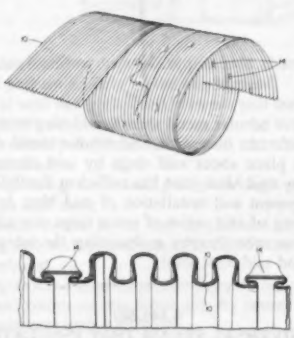
Emil Siegwart, Michael-Blatter-Strasse 6, D 6603 Sulzbach-Neuweiler, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 609,993, Sep. 3, 1975, abandoned, Division of Ser. No. 377,984, Aug., 1973, Pat. No. 3,913,623. This application Mar. 7, 1977, Ser. No. 774,933

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654963

Int. Cl.[2] F16L *11/16*

U.S. Cl. 138—122 **6 Claims**



1. A flexible corrugated tube comprising a succession of axially displaced convolutions of spirally coiled thin metal strip having longitudinally extending corrugations, the corrugations being of wave form having alternating arcuate axially spaced crests and troughs, the borders of successive tube convolutions overlapping each other with at least one corrugation in the overlying border portion of one convolution fitting into one corrugation of the underlying border portion of an adjoining convolution, characterized in that a plurality of detents are provided in the crests of said interfitting corrugations, said detents are circumferentially spaced apart and positioned about said interfitting corrugations, portions of said interfitting corrugations having said wave form extend between said detents, and each detent forms a generally S-shaped crimp on each side of said interfitting corrugations overlying the adjacent trough and locks together said interfitting corrugations and said border portions of said overlapping convolutions.

4,141,386

BLAST JOINT

Arthur E. Bergstrom, P.O. Box 92181, Houston, Tex. 77206

Filed Jul. 31, 1975, Ser. No. 600,616

Int. Cl.[2] F16L *11/14*

U.S. Cl. 138—147 **1 Claim**

1. A blast joint protecting an exterior portion of said flow tube from wear caused by contact with a high velocity flow of abrasive fluid, said blast joint comprising:

a series of contiguous heat and abrasive resistant wear rings having continuous substantially planar end walls from their inner periphery to their outer periphery, said end

walls being. to each other and at right angles to the longitudinal axis of said flow tube, each of said wear rings having an axial length not substantially greater than one inch, said series of wear rings being coaxially mounted on said tube and in direct contact therewith;

a pair of spaced annular clamping collar carried on said flow tube adjacent threaded end portions of said tube, said clamping collars holding said series of wear rings in said contiguous relationship about said flow tube; and

a protective tubular metal sheath enclosing said wear rings and in contact therewith, said tubular metal sheath being held in place about said rings by said clamping collars whereby said blast joint has sufficient flexibility to allow the shipment and installation of said blast joint with no fracturing of said series of wear rings due to bending of said flow tube thereby maintaining the integrity of said rings and said blast joint.

4,141,387

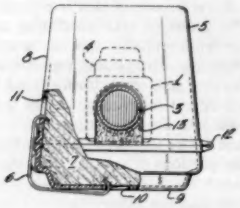
UNIVERSAL STEAM TRAP INSULATOR

George E. Campbell, Jr., Glen Riddle; Joseph W. Nelson, Lansdowne, and Gordon A. Russell, Strafford, all of Pa., assignors to Suntech, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 754,070, Dec. 27, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,871

Int. Cl.[2] F16L *59/04*

U.S. Cl. 138—158 **20 Claims**



1. A universal steam trap insulator comprising:

(a) a universal housing having two sections;

(b) two sides of a section having apertures which are formed at the joinder of the sections when the housing is placed around a steam trap and the sections are closed together;

(c) fibrous thermal insulation means, contained in the housing, which insulate the steam trap after the sections are closed around the steam trap; and

(d) the housing having at least one additional aperture which permits water to drain from the closed housing or permits an ultrasonic probe to be inserted to test the steam trap.

4,141,388

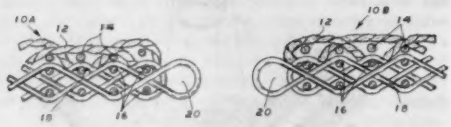
PAPER MACHINE DRYER FABRIC

Eric R. Romanski, Delmar, and Michael J. Josef, Clifton Park, both of N.Y., assignors to Albany International Corporation, Menands, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,278

Int. Cl.[2] D03D *25/00;* **D21F** *7/10, 7/12*

U.S. Cl. 139—383 A **12 Claims**



1. A dryer felt, which comprises: a multi-layer, flat woven, composite fabric having a woven base of synthetic polymeric resin monofilaments and a soft surface of yarns which interweave with the monofilaments of the woven base to provide stitching points which secure the surface yarns to the base.

4,141,389

WIRE-FASTENING MECHANISM

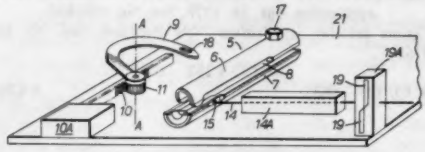
Heinz Göttel, Am Boksberg 10, 3203 Sarstedt, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,061

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743105

Int. Cl.[2] B21F *45/00*

U.S. Cl. 140—93 A **8 Claims**



1. A wire-fastening mechanism for fastening a wire to a connector lug by forming a cross loop of wire through a triangular formation of apertures in the lug, said mechanism comprising:

a support structure,

a hook-shaped needle pivotably mounted on the support structure and provided with an eye, and

a wire shaping and guiding device mounted on the support structure adjacent said needle, the said device comprising

a first member defining a first wire-guiding groove having entry and exit ends, and

a second member defining second and third wire-guiding grooves with respective entry and exit ends, said members being arranged in spaced opposition and said second, first and third grooves constituting successive half turns of a helical guide channel for wire to be formed into a coil in said device, said second groove being arranged to receive at its entry end wire to be formed into the coil, the first and second members being spaced from each other enabling the connector lug to be positioned therebetween with the apertures of said triangular formation of apertures respectively aligned between the exit end of said second groove and the entry end of the first groove, between the exit end of the first groove and the entry end of the third groove, and with the exit end of the third groove whereby wire formed into a coil by passage along said grooves is passed through the connector lug apertures, said needle being pivotable to a position between said members in which its eye is aligned with the exit end of said third groove whereby to receive the wire end emerging therefrom after pas-

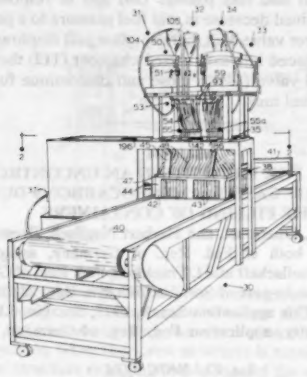
sage through the corresponding aperture lug and pull that wire end beneath the wire portion in said first groove to form a cross loop of wire.

4,141,390

OPTICAL ELECTRONIC SEED SOWING SYSTEM

Eugene W. Arnold, Centralia; Gregory K. Brock, Auburn, and David G. Halley, Renton, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 9, 1977, Ser. No. 859,116
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—9 **76 Claims**



1. A method for sowing seeds, comprising:
providing seeds from storage to each of a plurality of seed streams,
detecting in each said seed stream each seed therein as it passes a predetermined location,
cyclically distributing in stepwise fashion the detected seeds in each said seed stream into each of a series of substreams, the stepping from one substream to the next being actuated by the detecting step, each cycle ending at a home position, from which seeds distributed thereto are returned to storage instead of being distributed into a substream,
sensing said home position in each cycle,
dispensing each seed in each cycle and from each of said streams into different receptacles of a translatable shutter having a series of rows of receptacles,
translating said shutter forward one row at the completion of each of a given number of cycles,
upon completion of a series of said given number of cycles sufficient to fill all the receptacles of said shutter, translating said shutter to a planting position,
dropping all said seeds from said shutter into planting medium at said planting position,
returning said shutter back to an initial seed receiving position after its said seeds have been dropped, and
again dispensing seeds into said shutter as before.

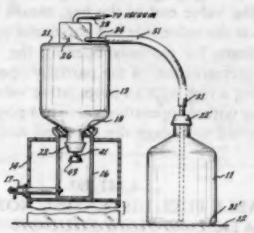
4,141,391

WATER LIFTING SYSTEM

Lester W. Smith, 10525 Compton Blvd. #10, Bellflower, Calif. 90706

Filed Jan. 13, 1978, Ser. No. 869,251
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—59 **3 Claims**

1. A water lifting system in combination with a source bottle and an inverted supply bottle which is elevated above the source bottle; said system comprising:
said supply bottle having a neck and opening and a substantially flat bottom disposed above the neck thereof;
said supply bottle having a hole formed in said bottom;
a chamber with a tubular wall disposed on top of and communicating by means of said hole in said bottom with said supply bottle;
a tubulation attached to said tubular wall, extending from said chamber and communicating with the interior thereof;
a spiral wall disposed within said chamber so that any fluid entering said chamber through said tubulation is forced to form a vortex;
means for coupling said tubulation to said source bottle;
means for lifting the water from said source bottle into said chamber so that said liquid forms a vortex within said chamber as the liquid falls through said hole;



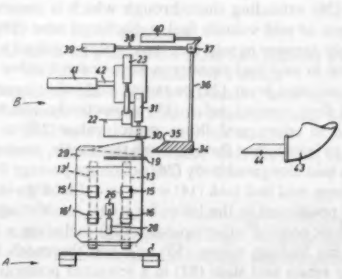
an annular member disposed within said chamber and disposed perpendicularly to the axis thereof;
said spiral wall being disposed between said member and the bottom of said chamber;
a piston slidably disposed within said chamber and above said member;
a rod depending from said piston through said hole and through said neck;
a plug fixed to the lower end of said rod and capable of sealing said neck of said supply bottle whenever said pison is lifted; and
a valve gate fixed to said rod and disposed between said hole and said piston so that when gravity causes the piston to fall, said gate seals said hole.

4,141,392

APPARATUS FOR AUTOMATIC INSERTION OF VALVED BAGS ON BAG-FILLING MACHINES

Mario Moltrasio, Bergamo, Italy, assignor to Ventomatic Italiana S.r.l., Bergamo, Italy

Filed Apr. 11, 1977, Ser. No. 786,504
Claims priority, application Italy, May 6, 1976, 23018 A/76
Int. Cl.[2] B65B *1/00*; B07C *9/00*
U.S. Cl. 141—98 **11 Claims**



1. An apparatus for automatic insertion of a valved bag on a charging nozzle of a machine adapted to fill the bag with material in granular or powder form, comprising a distributing device and at least one bag inserting device, said distributing device for receiving bags with their valves closed from a

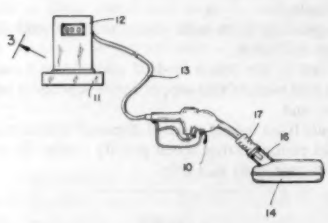
supply thereof and for feeding them sequentially to at least one bag inserting device, said distributing device including conveying means extending horizontally beneath each such said inserting device, each such inserting device including a movable bag-deflecting member for picking up a bag from the distributing device and which is arranged in a grazing manner relative to the conveying means and which causes the bag to be deflected from a horizontal position on the conveying means into a vertical position, two juxtaposed running endless belts and at least one set of pressure rolls cooperating with each belt, said running belts and pressure rolls being positioned for receiving a deflected bag between them for entraining and conveying the bag therebetween upwardly valve-end first towards two bag-holding jaws arranged above said running belts and pressure rolls, means for engaging said jaws against opposite sides of the bag below the valve end of the bag, means for arranging the bag top end at the valve side in a horizontal position above said jaws and means for partially opening the valve, means for testing the operativeness of the partially opened valve, means for discarding a bag with an inoperative valve, and means for placing a bag with an operative valve in a position in which the valve is adapted to engage the charging nozzle.

4,141,393

SEALABLE FUEL DISPENSING NOZZLE WITH AUTOMATIC LOW-FLOW SHUT-OFF MECHANISM

Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jul. 2, 1976, Ser. No. 702,315
Int. Cl.² B65B *3/26*
U.S. Cl. 141—206 **3 Claims**



1. In a closed system adapted to carry a volatile fuel said system including a hand actuated dispensing nozzle operable to sealably engage a fuel tank (14) to be filled, and being further operable to automatically discontinue fuel flow therethrough in response to either an overpressuring of the fuel system beyond a predetermined pressure, or to the inadvertent decrease in pressure within the liquid portion of the fuel system, said nozzle including an elongated body (24) having a fuel passage (26) extending therethrough which is communicated to a source of said volatile fuel, a discharge tube (29) adapted to sealably register in said fuel tank, a flow control valve (19) positioned in said fuel passage, a flow control valve operator (21), an actuator lever (22) engaging said valve operator (21) and said flow control valve (19) respectively and being displaceable to adjust said flow control valve (19) to an open position to initiate fuel flow through the nozzle, means depending from said elongated body (24) defining a passage for vapors which leave said fuel tank (14) when said discharge tube (29) is sealably positioned in the latter for a fuel transfer operation.

said flow control valve operator (21) including a stem (51) having locking means (53) engaged therewith to releasably retain said stem (51) in a retracted position during a period of fuel flow through the nozzle, said locking means (53) being disengageable to release said stem (51) in response to a predetemined fuel pressure condition whereby to allow said flow control valve (19) to close,

means forming a plurality of pressure sensitive chambers (68, 81, 86, 112) being axially aligned transversely of said elongated body (24) and being operably engaged through linkage means with said stem locking means (53),

at least one of said plurality of pressure sensitive chambers (112) being disposed to one side of said stem (51), and including means forming a cavity in said elongated body (24), a diaphragm (99) disposed across said cavity to thereby form said closed chamber (112), and passage means (111) communicating said closed chamber (112) with said fuel passage (26), the latter having an inlet opening into said fuel passage (26) at a point upstream of said flow control valve (19),

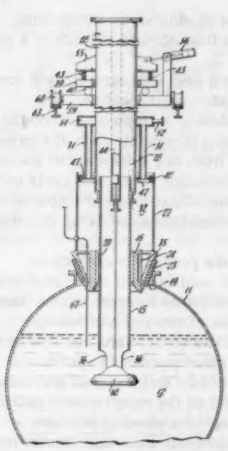
whereby said pressure sensitive chamber (112) will sense the pressure in said fuel passage (26) and in response to a predetermined decrease in said fuel pressure to a predetermined lower value, will thereby cause said diaphragm (99) to be displaced into said closed chamber (112) thereby to cause said valve (19) to close and discontinue fuel flow into said fuel tank.

4,141,394

APPARATUS FOR PREVENTING AN UNCONTROLLED EMISSION OF GASEOUS HYDROCARBONS DURING THE FILLING OF CONTAINERS

Josef Lassman, Oberursel, and Herbert Nuglisch, Bremthal am Konigsberg, both of Fed. Rep. of Germany, assignors to Edeleanu Gesellschaft mbH, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 643,898, Dec. 23, 1975, abandoned. This application Sep. 8, 1977, Ser. No. 831,571
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1975, 2529218
Int. Cl.² B67C *3/34*
U.S. Cl. 141—284 **3 Claims**



1. In combination with apparatus for filling hydrocarbon liquid containers or the like through a filling aperture therein, said apparatus having a fill pipe and a concentric outer tube for preventing uncontrolled escape of vapor from the container being filled, and having means for sealing said outer tube into vapor-tight contact with said filling aperture, the improvement comprising

a hydraulic cylinder and piston situated within said fill pipe for movably extending said fill pipe relative to said outer tube in order to discharge said filling liquid adjacent to the bottom of a container being filled,

conduit means associated with said outer tube for conducting said escaping vapors,

means for pivotally supporting said fill pipe near the upper end thereof for lateral adjustment of the fill pipe relative to said container,

means connected to said pivotal support means for neutralizing the forces caused by pivoting of said fill pipe, and

means for longitudinally moving said pivotal supporting means and said fill pipe together relative to said container.

4,141,395

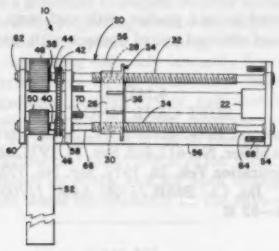
LOG SPLITTER

Allan H. Arzt, Box 392 King Ave., Baltimore, Md. 21237

Filed Aug. 4, 1977, Ser. No. 821,754

Int. Cl.[2] B27L *7/00*

U.S. Cl. 144—193 R **10 Claims**



1. In a log splitter having a wedge, means for splitting logs with the wedge, including screw structure and drive means therefor and means engaging the screw structure and travelling therealong when the screw structure is rotated for urging the screw structure engaging means toward the wedge to split a log with the wedge, said drive means including an adapter attached to the screw structure permitting use of a motor vehicle drive wheel when placed thereon to rotate the screw structure with the periphery of the drive wheel, the improvement comprising: means for preventing a said motor vehicle drive wheel when on the adapter, from over-running the adapter, said means engaging the screw structure defining means for aligning log-splitting loads with the screw structure for minimizing bending stress on the screw structure during splitting, and means limiting travel of the screw structure engaging means along the screw structure.

4,141,396

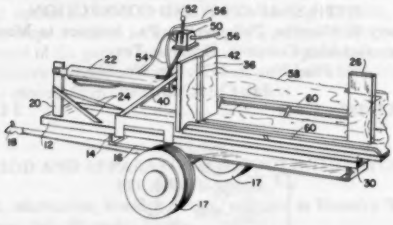
HYDRAULIC LOG SPLITTER

James J. McCallister, Mayer Thorpe, Alberta, Canada

Filed Sep. 12, 1977, Ser. No. 832,597

Int. Cl.[2] B27L *7/00*

U.S. Cl. 144—193 A **6 Claims**



1. A log splitter comprising a frame; a straight splitting blade fixed vertically to one end of said frame; a table member adapted to support logs to be split, said table member being slidably mounted on said frame; said table member having an elongated blade clearance slot therein; log-abutment means fixed to said table and adapted to push one end of the log on said table so as to engage the opposite end against said blade; power transfer means operatively connected to said abutment means to reciprocally move same to force said log through said blade; and retaining means on each side of said table extending outwardly and upwardly therefrom to prevent logs on said table from falling therefrom.

4,141,397

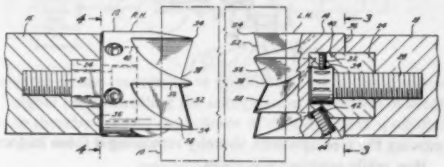
CHUCK ASSEMBLY FOR A VENEER LATHE

Charles J. Schmidt, P.O. Box 757, Diboll, Tex. 75941

Filed Dec. 16, 1977, Ser. No. 861,223

Int. Cl.[2] B27C *7/04;* **B27L** *5/00*

U.S. Cl. 144—209 R **7 Claims**



1. A chuck assembly for attachment to a drive spindle of a veneer lathe comprising,

a drive adapter having means for connection to the drive spindle and having a driving head,

a chuck having first and second ends,

said first end having a recess sized and shaped to fit over the driving head of the drive adapter,

releasable fastening means extending between the first end and the driving head through the side of the chuck for releasably fastening the chuck to the driving head,

said second end of the chuck including a plurality of blades, each of the blades including an outer edge extending from the longitudinal axis of the chuck radially outwardly to the outside of the chuck and also extending outwardly from the second end of the chuck, each of said blades including a first flat side longitudinally extending from its edge, said flat side being on the leading face of the blade in its direction of rotation thereby providing a driving area, the second side of each of the blades extending from its outer edge to the first side of an adjacent blade thereby providing a self-cleaning recess.

4,141,398

METHOD AND APPARATUS FOR SEVERING TREE ROOTS AND FELLING TREES

Lars H. Widegren, and Tage O. Keskitalo, both of Kiruna, Sweden, assignors to Firma Elektro-Diesel, Kiruna, Sweden

Filed Nov. 21, 1975, Ser. No. 634,104

Claims priority, application Sweden, Nov. 27, 1974, 148909

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—309 AC **12 Claims**

1. A method of tree cutting and removal whereby said tree is removed without the application of high forces to the gripping means which would otherwise damage said tree, comprising the steps of:

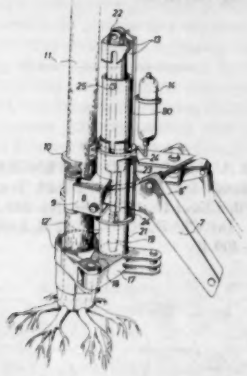
gripping said tree with a gripping means,

severing the tree roots by a cutting means which is moved downward, substantially parallel to said tree,

actuating said cutting means periodically by accelerating it vigorously, thereby

accumulating a substantial amount of kinetic energy in the

cutting means by accelerating said cutting means relative to said gripping means which is used for cutting said roots,



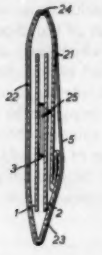
moving the tree upwards, thereby removing it from its location while severing the roots.

4,141,399

EXPANDABLE BAG WITH INTERNAL BIASING MEANS

Martin Zoland, 76 Raglan St., Preston, Melbourne, Australia (3072)

Filed Dec. 5, 1977, Ser. No. 857,392
Int. Cl.[2] A45C *7/00*
U.S. Cl. 150—31 **5 Claims**



1. An expandable bag having a closure and insert in said bag, said insert comprising a pair of parallel sheet members, a first means biasing said parallel sheet members apart, and restraining means external to the bag and operable to maintain the sheet members relatively closely spaced and the bag in a collapsed state whereupon, on removal of the restraining means, the biasing means cause the sheet members to move apart, whereby the bag is expanded.

4,141,400

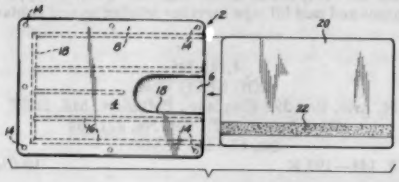
PROTECTIVE HOLDER FOR MAGNETIC CARDS

James H. Mangan, 4601 19th Rd., North, Arlington, Va. 22207

Filed May 19, 1978, Ser. No. 907,493
Int. Cl.[2] A45C *11/18*
U.S. Cl. 150—39 **5 Claims**

1. A protective holder for magnetic cards comprising:

a substantially rigid body defining a thin pocket opening through one end edge thereof, one of the side walls of said pocket having at least one pair of spaced parallel ribs extending inwardly from said one end edge said ribs being of a height less than the thickness of said pocket whereby a card having a magnetized strip on one face thereof may



be inserted in said pocket with said strip extending between said ribs and out of contact with said one wall.

4,141,401

SOFT CARRYING CASE

Arno R. Hindemit, 2054 Sheraton Dr., Santa Clara, Calif. 95050

Continuation of Ser. No. 612,403, Sep. 11, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,408
Int. Cl.[2] B65B *11/00*; A45C *11/00*
U.S. Cl. 150—52 R **4 Claims**

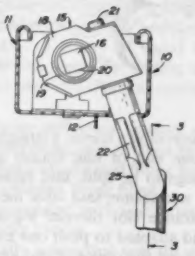
1. In combination, a portable, battery-powered electronic device having a power-on switch, and a carrying case of soft pliable material conforming substantially to the contours of the device and having a non-pliable, transparent insert positioned on the case to correspond to the location of the power-on switch of the device when that device is enclosed in the carrying case, said insert preventing interference of the carrying case with the power-on switch to preclude inadvertent actuation thereof when the device is enclosed in the carrying case.

4,141,402

VENETIAN BLIND TILTER OPERATING MECHANISM WITH SNAP-ON WAND CONNECTION

Anthony F. Marotto, Philadelphia, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Nov. 7, 1977, Ser. No. 849,402
Int. Cl.[2] E06B *9/26*
U.S. Cl. 160—176 R **3 Claims**



1. A venetian blind tilter operating mechanism comprising a

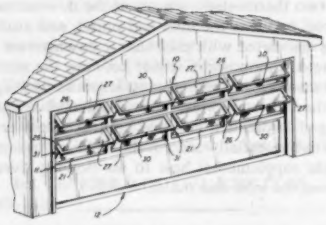
head rail, a rotary stub shaft depending from the head rail and rotatable to effect slat tilting, a cross piece on the depending end of said stub shaft, a manually actuable wand for end-to-end connection to said stub shaft and gravitational dependence therefrom, a resilient clip on one end of said wand for resilient snap engagement about said cross piece, said clip including a pair of generally upwardly extending resilient legs having a space therebetween rotatably receiving said cross piece, said space having a reduced throat between the free ends of said legs, and said throat being dimensioned less than said cross piece for retention of the latter in said space against inadvertent removal and permitting of deliberate removal by the resilience of said legs, and a generally U-shaped member including a pair of laterally outwardly projecting arms on the depending end of said stub shaft, said cross piece extending between said arms, said stub shaft depending obliquely inwardly from said head rail, and said cross piece being of laterally distended cross sectional configuration oblique to said stub shaft so that the major axis of said laterally distended cross section does not pass through a vertical position so as to prevent inadvertent disengagement of the clip and removal of the wand, while said cross piece presents its minor axis for snap engagement into said clip with the wand unobstructed by the environment.

4,141,403

GARAGE-PATIO DOOR

Rocco L. Church, R. D. 5, N. Division St. Rd., Auburn, N.Y. 13021

Filed Jun. 16, 1978, Ser. No. 916,269
Int. Cl.[2] E05D *15/24, 15/38*
U.S. Cl. 160—201 **9 Claims**



1. In a garage structure, a garage door comprised of a plurality of hinged sections, the door being movable between a substantially vertical closed position and a substantially horizontal open position, at least one of the door sections having a plurality of openings therethrough, a closure member for each of said openings, each closure member being movable outwardly from a closed to an open position, and roller means positioned in the garage structure so as to be operable to return any closures in open position to closed position whenever the door is moved from closed to open position.

4,141,404

METHOD AND APPARATUS FOR COOLING RECYCLED FOUNDRY SAND

Carl R. McMullen, Waverly, Tenn., assignor to Foundry Technology, Inc., Waverly, Tenn.

Filed Jul. 25, 1977, Ser. No. 818,653
Int. Cl.[2] B22C *5/08*
U.S. Cl. 164—4 **28 Claims**

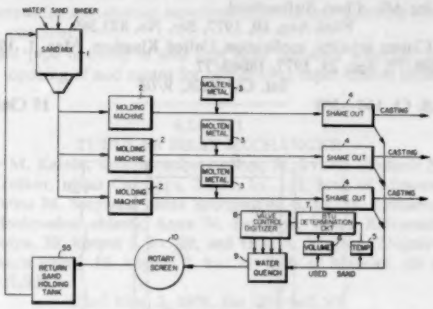
1. An apparatus for cooling recycled mold forming material in a sand coating foundry system comprising:

a mold forming material conveyor;

a first non contact sensor for generating a first signal representing the amount of the material on said conveyor;

a second non contact sensor for generating a second signal representing the temperature of the material on said conveyor;

valve means adapted to be energized for applying a cooling agent on the mold forming material on said conveyor; and



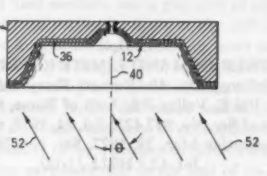
control means responsive to said first signal and said second signal for controlling the energization of said valve means to thereby control the volume of cooling agent applied by said valve means.

4,141,405

METHOD OF FABRICATING A FUNNEL-SHAPED MINIATURE ELECTRODE FOR USE AS A FIELD IONIZATION SOURCE

Charles A. Spindt, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jul. 27, 1977, Ser. No. 819,557
Int. Cl.[2] B22D *23/00*
U.S. Cl. 164—46 **18 Claims**



1. A method of fabricating a funnel-electrode for use in a field ionization source, which method includes the use of a female mold formed with an aperture therethrough having a plurality of different diameter wall sections of decreasing size in going along the aperture axis, said method comprising the steps of;

a. depositing a layer of electrically conducting material onto the female mold to a thickness which tapers to less than about one micron at the small diameter end of the mold aperture and substantially conforms to the shape of the aperture therein to form a non-porous funnel-electrode, and

b. separating said funnel-electrode from said female mold.

9. A method of fabricating a funnel-electrode for use in a field ionization source comprising;

a. preparing a female mold having an aperture substantially conforming in shape to at least a part of the funnel-electrode to be deposited thereon, which aperture extends through the mold and includes a plurality of increasingly smaller diameter generally tapered wall sections,

b. depositing electrically conducting material on the female mold that substantially conforms to the mold to form a non-porous funnel-electrode with a wall thickness which tapers to less than about one micron at the small diameter end of the mold, and

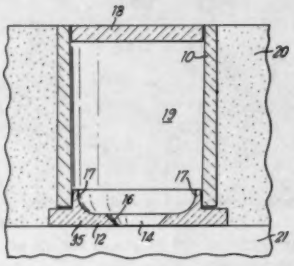
c. separating said funnel-electrode from said female mold.

4,141,406

BREAKER CORES

Nick Wukovich, North Olmsted, Ohio, assignor to Foseco Trading AG., Chur, Switzerland

Filed Aug. 10, 1977, Ser. No. 823,369
Claims priority, application United Kingdom, Mar. 1, 1977, 8580/77; Apr. 29, 1977, 18048/77
Int. Cl.[2] B22C 9/08
U.S. Cl. 164—359 15 Claims



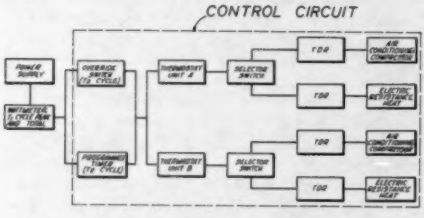
1. In a metal casting mold including a cavity and a riser having a lining sleeve therein, an improved breaker core, said core comprising a base having an aperture therein and a lip projecting up from said base, said lip comprising a tapered surface frictionally engaging in a wedging action a peripheral surface of said sleeve to securely hold said core in place in said sleeve to form an integral unit.

4,141,407

POWER DEMAND LIMITING CIRCUIT

Harry H. Briscoe, Rte. 10, Burnett Ferry Rd., and John L. Pillsbury, 106 E. Valley Rd., both of Rome, Ga. 30161

Continuation of Ser. No. 597,423, Jul. 21, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,358
Int. Cl.[2] H02J 13/00
U.S. Cl. 165—12 20 Claims



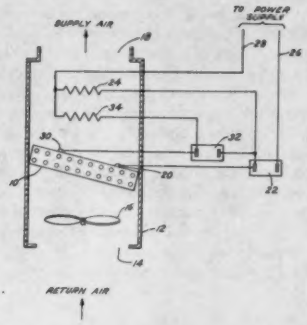
1. In a consumer's electrical circuit having an electrical load coupled with a municipal source of electric current through meter means for metering power consumption during a time period of relatively long duration and for metering maximum power demand during any time period in a succession of periods of relatively short duration occurring during the time period of relatively long duration, the improvement comprising means for allowing the consumer to control his billing rate insofar as determined by maximum power demand during said periods of short duration, comprising programmable timer means for interrupting the coupling of the electrical load with the municipal source of electric current for a selected time at least once during each of said demand periods of relatively short duration.

4,141,408

SUPPLEMENTARY HEAT CONTROL FOR HEAT PUMP SYSTEM

Jack V. Garnett, Fort Smith, Ak., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Jun. 16, 1976, Ser. No. 696,646
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—29 2 Claims



1. In a heat pump system, the improvement of apparatus for controlling supplementary heat input into the heating cycle of the heat pump system, said system of the type having a cool air inlet, a warm air outlet, a heating coil intermediate the inlet and outlet, and means for moving air from the inlet over the coil to the outlet, said apparatus comprising in combination:

at least two thermostatic sensors at the downstream side of said coil between the inlet and outlet, and auxiliary heat means associated with each sensor downstream from said associated thermostatic sensor between the inlet and outlet, control means operative in response to a signal from each thermostatic sensor means, said auxiliary heat means arranged in parallel, and said control means arranged in series to sequentially control the auxiliary heat means and provide supplemental heat to air flowing over the coil between the inlet and outlet.

4,141,409

CONDENSER HEADER CONSTRUCTION

Ivan D. Woodhull, Jr., Flat Rock, and Thomas H. Liedel, Maybee, both of Mich., assignors to Karmazin Products Corporation, Wyandotte, Mich.

Filed Apr. 21, 1977, Ser. No. 789,412
Int. Cl.[2] F28B 9/08; F28F 9/22
U.S. Cl. 165—110 3 Claims

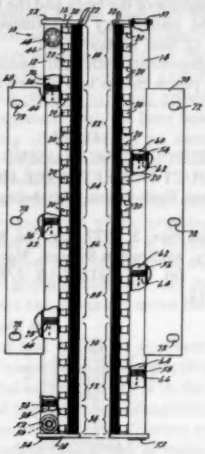
1. A condenser comprising:

a plurality of vertically disposed fin members each having a plurality of integral horizontal tubular projections, said fin members being arranged in a stacked substantially coplanar spaced relationship with said tubular projections being arranged in a telescopic nested relationship so as to define elongated fluid conducting conduit members;

a first elongated tubular member extending generally perpendicular to said fluid conducting conduit members and having an interior connected in fluid communication with said conduit members;

a plurality of baffle members secured within said tubular member in a parallel spaced apart relationship to define a series of chambers within said tubular member, said baffle members being spaced so as to have a first predetermined number of conduit members opening into a first chamber defined by a first and second baffle member and a second number of said conduit members opening into a second chamber defined by said second and a third baffle, said first predetermined number of fluid conduits comprising an inlet group for conducting fluid into said first chamber

and an outlet group for conducting fluid out of said first chamber, said inlet group having a greater number of said fluid conduits than said outlet group; and



each of said baffle members having a bore allowing direct communication between adjacent chambers, said bore being adapted to allow condensed fluid to pass therethrough and being further adapted to prevent passage of uncondensed fluid therethrough.

4,141,410

EVAPORATOR

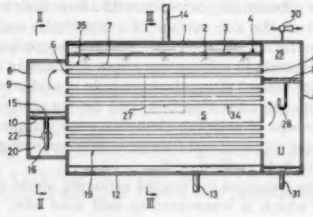
Masahura Takada, Kobe, Japan, assignor to Sasakura Engineering Company, Limited, Osaka, Japan

Filed Apr. 18, 1977, Ser. No. 788,113

Claims priority, application Japan, Apr. 20, 1976, 51-49638[U]

Int. Cl.[2] F28B *9/08, 9/02;* **F28F** *25/10*

U.S. Cl. 165—113 **3 Claims**



1. An evaporator comprising

a casing,

an evaporation chamber defined within said casing and having thereover feed liquid spray means,

first and second headers on the outside of said evaporation chamber,

plural bundles of substantially horizontal heat-transfer tubes extending within said evaporation chamber between said headers and so arranged that steam will flow through said tubes successively from one of said bundles to the next upper bundle,

the number of said tubes in each bundle being smaller than that in the next lower bundle,

concentrated liquid collector means at the bottom of said evaporation chamber,

at least one plate positioned in said first header between adjacent two of said tube bundles and formed with at least one opening therethrough,

a pipe extending from said opening down into a first head chamber defined in said first header under said plate at the inlet of the bottom tube bundle, through which pipe condensate collected on said plate will fall by gravity into said first head chamber, and

means for introducing superheated steam into said first head chamber,

said pipe opening in said first head chamber adjacent the opening of said means for introducing super-heated steam.

4,141,411

TUBULAR HEAT EXCHANGER

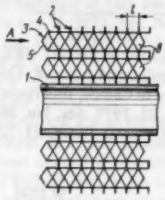
Igor M. Kalnin, Kropotkinskaya ulitsa, 26, kv. 13; Vladimir N. Krotkov, ulitsa Chkalova, 24/32, kv. 132, both of Moscow; Taisia M. Sutyrina, ulitsa Sportivnaya, 3, kv. 54, Lytkarino Moskovskoi oblasti; Anna N. Sergeeva, ulitsa Krivorozhskaya, 23, korpus 1, kv. 90, and Oleg A. Sergeev, Zhigulevskaya ulitsa, 12, korpus 2, kv. 75, both of Moscow, all of U.S.S.R.

Filed Mar. 3, 1976, Ser. No. 663,530

Claims priority, application U.S.S.R., Jun. 14, 1973, 1930563; Feb. 28, 1974, 1997278; May 14, 1974, 2019578

Int. Cl.[2] F28F *1/10*

U.S. Cl. 165—151 **4 Claims**



1. A tubular heat exchanger comprising a tube adapted for conveying a first fluid medium, and a plurality of adjoining fins mounted on said tube perpendicularly to the axis thereof and uniformly spaced longitudinally therealong, each said fin comprising a plate having a length and width and including a planar portion surrounding said tube and lines of corrugations extending transversely across the entire width of the fin at opposite sides of said tube, said lines of corrugations extending parallel to one another in the direction of flow of a second fluid medium extending perpendicular to the axis of the tube, each said corrugation including opposite side walls extending perpendicularly from said plate in spaced parallel relation, said corrugations including front walls connecting the side walls, the corrugations alternating in each line such that the front wall of one corrugation projects axially forwardly as an apex portion away from the plane of said plate and the front wall of the adjacent corrugation projects axially rearwardly as an apex portion towards the plane of said plate, said forwardly and rearwardly projecting front walls having substantially equal length, said apex portions of the adjoining corrugations defining passages for the flow of said second fluid medium through the corrugations, said corrugations being disposed at one side of the plane of said plate such that the forwardly projecting walls of the corrugations of one fin abut against the rearwardly projecting walls of the corrugations of the adjoining fin to maintain said planar portions of said fins in spaced relation along said tube, said corrugations each having a height between said side walls which is substantially equal to the spacing between the planar portions of adjoining fins.

4,141,412

AIR-TO-AIR HEAT RECUPERATING UNIT

Donald L. Culbertson, Mountain Lakes, N.J.

Filed Jan. 27, 1977, Ser. No. 762,881

Int. Cl.[2] F28F *3/08*

U.S. Cl. 165—166 **19 Claims**

2. A heat exchanger comprising a plurality of juxtaposed, substantially parallel sheets defining successive passageways

between each pair of said sheets, spacer members between successive pairs of said sheets for maintaining said heat exchanger in rigid position and for dividing each of said passageways into n+1 adjacent channels wherein n is an even integer between 2 and about 10, said successive passageways being provided for the flow of two gas streams with each of said gas

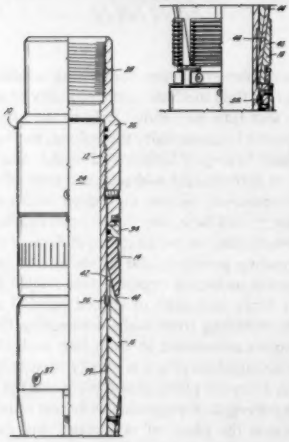
streams flowing through an alternate passageway and wherein each of said gas streams enter its respective passageway through the end walls at opposite corners of the same end of said heat exchanger, flow through said channels in each of said passageways in the same and substantially parallel direction and leave the heat exchanger through the other end wall at diagonally opposite ends of said heat exchanger.

4,141,413

HYDRAULIC ACTUATED WEIGHT SET WELL PACKER

Arthur J. Morris, Magnolia, and James K. Garner, Jr., Houston, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Dec. 22, 1977, Ser. No. 863,297
Int. Cl.[2] E21B *23/04, 33/129*
U.S. Cl. 166—120 **5 Claims**



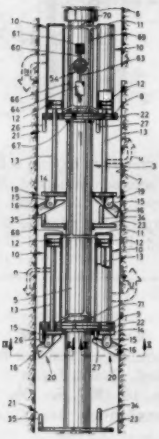
1. A well packer for connection in a well tubing comprising,
a body,
packing means surrounding said body,
expander means positioned below said packing means and surrounding said body and longitudinally movable on said body,
said body including a stop limiting the upward movement of the expander means,
coacting wedge surfaces between the lower end of the packing means and the upper end of the expander means for expanding the packing means outwardly upon relative movement of the expander means towards the packing means,
slip means positioned about the body and adjacent the lower end of the expander means,
second coacting wedge surfaces between said expander means and said slip means for expanding the slip means outwardly upon relative movement of the slip means towards the expander means,
piston means positioned about the body and longitudinally movable on said body whereby upward movement of the piston expands the slip means and said packing means,
port means in the body providing a fluid passageway between the interior of the body and the bottom of the piston whereby the piston may be actuated upwardly by the application of fluid pressure, and
means in engagement with said piston means yieldably urging said piston means in a downwardly direction.

4,141,414

DEVICE FOR SUPPORTING, RAISING AND LOWERING DUCT IN DEEP BORE HOLE

Sven H. Johansson, Saah-Scania Aktiebolag, Linköping, Sweden (S581 88)

Filed Nov. 3, 1977, Ser. No. 848,220
Claims priority, application Sweden, Nov. 5, 1976, 7612372
Int. Cl.[2] E21B *1/08, 3/12*
U.S. Cl. 166—212 **3 Claims**



1. A device whereby a load such as a duct section, having an axis that can substantially coincide with a bore hole axis, can be supported from the side surface of a bore hole, and whereby said load can be alternatively and selectively confined against motion in response to a force that urges it axially in one direction or can be moved along the bore hole in said one direction or in the opposite axial direction, said device comprising:
A. two groups of gripping elements, each gripping element
(1) having an outer end portion which can bitingly engage a bore hole surface, and
(2) being mounted for limited swinging about a swinging axis which is transverse to said load axis, by which swinging said outer end portion is carried in a surface-engaging direction, obliquely away from the load axis and in said opposite axial direction, and in an opposite surface-disengaging direction,
(3) each of said gripping elements being biased in its surface-disengaging direction;
B. a pair of reciprocable drivers, one for each group of gripping elements, said drivers and their respective groups of gripping elements being spaced from one another along the load axis and each of said drivers being connected between its group of gripping elements and the load and arranged to move its group of gripping elements relative to the load through defined strokes in opposite axial directions;
C. coordinating means connected to both of said reciprocable drivers to constrain them to synchronized motion wherein each driver carries its group of gripping elements in the axial direction opposite to that in which the other group of gripping elements is being carried and the two

drivers simultaneously begin and end their respective strokes; and

D. a directional control device movable in directions substantially transverse to the load axis between a pair of defined positions, said directional control device comprising two groups of abutment members that are formed and arranged for engagement with the gripping elements near the ends of their strokes, to swing gripping elements that are out of engagement with the bore hole surface in their surface-engaging direction and to swing gripping elements that are engaged with said surface in their surface-disengaging direction,

(1) one of said groups of abutment members being arranged for engagement of the gripping elements when the directional control device is in one of its said positions and effecting such engagement and disengagement between the gripping elements and the bore hole surface as enables the drivers to move the load in said one axial direction, and

(2) the other of said groups of abutment members being arranged for engagement of the gripping elements when the directional control device is in the other of its said positions and effecting such engagement and disengagement between the gripping elements and the bore hole surface as enables the drivers to move the load in said opposite axial direction.

4,141,415

METHOD OF RECOVERING HYDROCARBONS BY IMPROVING THE VERTICAL CONFORMANCE IN HEAVY OIL FORMATIONS

Ching H. Wu, Golden, Colo.; Alfred Brown; Daniel T. Konopnicki, both of Houston, and Joseph C. Allen, Bellaire, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,077
Int. Cl.[2] E21B *43/24, 47/026*
U.S. Cl. 166—252 **10 Claims**

1. A method for recovering viscous hydrocarbon crude stock from a subterranean formation penetrated by at least one well borehole which comprises:

determining the location of those regions of low permeability within said formation having an oil saturation of greater than 50 percent;

injecting a hydrocarbon solvent into said formation at intervals within said low permeability regions, said intervals being spaced to permit thermal communication of a heated fluid from said intervals to the zones of the formation therebetween;

injecting a heated fluid into a region of said formation spanning a plurality of solvent injection intervals; and

recovering crude stock from a well penetrating said formation.

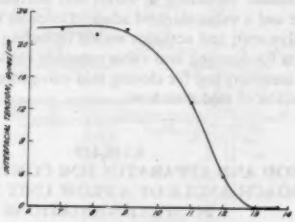
4,141,416

ENHANCED OIL RECOVERY USING ALKALINE SODIUM SILICATE SOLUTIONS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 689,199, May 26, 1976, Pat. No. 4,081,029. This application Sep. 27, 1977, Ser. No. 837,042
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—270 **20 Claims**

1. A process for the enhanced recovery of oil from a subterranean reservoir penetrated by at least one injection well and at least one production well spaced therefrom which comprises injecting through an injection well and into said reservoir about 0.1 to about 1 reservoir pore volume of a dilute aqueous solution of alkaline alkali metal silicate having a molar ratio of M_2O/SiO_2 of 1 or above wherein M is an alkali metal atom, which aqueous solution of alkaline alkali metal silicate reduces



the interfacial tension of said oil with water at high pH to about 0.1 dyne/cm or less, and recovering oil at the production well.

4,141,417

ENHANCED OIL RECOVERY

Frank C. Schora, Palatine, and John C. Janka, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,937
Int. Cl.[2] E21B *43/22, 43/25*
U.S. Cl. 166—305 R **10 Claims**

1. A process for enhanced oil recovery by wells from an underground deposit comprising:

injecting hydrogen-rich gas in the absence of added hydrogenation catalyst into said deposit, the gas and deposit being at ambient deposit temperatures of less than 300° F.;

maintaining the hydrogen-rich gas in contact with crude oil in reservoirs at ambient reservoir temperatures of less than 300° F. for a time sufficient to reduce to desired levels viscosity and sulfur content of said petroleum by reaction with said hydrogen; and

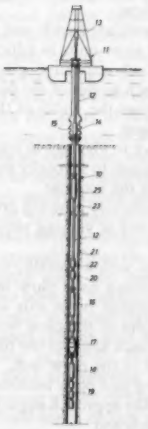
recovering the liquid petroleum from said underground deposit.

4,141,418

SAFETY VALVE HYDRAULICALLY OPERATED BY TELESCOPIC DRILL STEM MOVEMENT

Benjamin P. Nutter, Bellville, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,714
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—324 **17 Claims**



1. Safety valve apparatus adapted for closing a well pipe against upward flow of fluids therethrough, comprising: tubu-

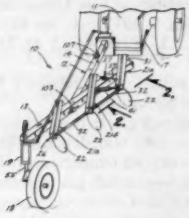
lar telescoping members defining a flow passage and movable between extended and contracted relative positions; full-opening valve means for opening and closing said flow passage, said valve means including a valve seat surrounding said flow passage and a valve element adapted to close upwardly against said valve seat; and actuator means including oppositely moving parts for opening said valve means in response to extension of said members and for closing said valve means in response to contraction of said members.

4,141,419

METHOD AND APPARATUS FOR CONTROLLING THE APPROACH ANGLE OF A PLOW UNIT IN RESPONSE TO SPEED VARIATIONS

Wesley F. Buchele; William I. Baldwin, both of Ames; James H. Eidet, Armstrong, and Steven J. Marley, Ames, all of Iowa, assignors to Iowa State Univ. Research Foundation, Inc., Ames, Iowa

Filed Mar. 21, 1977, Ser. No. 779,674
Int. Cl.[2] A01B *61/00, 65/02*
U.S. Cl. 172—1 **4 Claims**



1. A variable approach angle moldboard plow implement for forming furrows of a predetermined width including an elongated tool bar connectible to a tractor, comprising:

(a) a plurality of moldboard plow units, each comprising a plow bottom having a forward point and a pivoted plow bottom support frame, said plow bottom forming an approach angle with the line of travel of said implement,

(b) means for pivotally connecting said support frames to the tool bar at longitudinally spaced positions for pivotal movement of the plow units about respective pivot axes arranged in vertical alignment with the forward points of the respective plow bottoms,

(c) means interconnecting adjacent plow units for pivotal movement in unison,

(d) power means associated with said plow units for pivotally moving said plow units in unison relative to the tool bar and about said respective pivot axes to uniformly adjust the approach angles of the plow bottoms, whereby to maintain constant the width of the furrows formed by said plow units, and

(e) means responsive to changes in tractor speed for actuating said power means to pivotally move said plow units in unison relative to the tool bar.

3. A method for uniformly plowing ground with a predetermined furrow width and at varying plowing speeds, comprising the steps of:

(a) forming furrows with a plurality of plow units,

(b) pivotally supporting each plow unit for pivotal movement about a vertical pivot axis arranged in alignment with the front point of the plow bottom of the plow unit to vary the approach angle of the plow bottom relative to the line of travel of the plow unit,

(c) pivotally moving said plow bottoms about the pivot axes therefor to vary the approach angle thereof inversely with the plowing speed, and

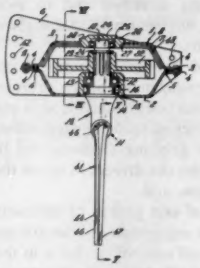
(d) maintaining the width of the furrows formed by the plow units constant as said plow units move along the line of travel thereof.

4,141,420

ROTARY HARROWS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Division of Ser. No. 556,149, Mar. 6, 1975, Pat. No. 4,029,153.
This application Apr. 5, 1977, Ser. No. 784,818
Claims priority, application Netherlands, Mar. 7, 1974, 7403070
Int. Cl.[2] A01B *33/06*
U.S. Cl. 172—59 **6 Claims**



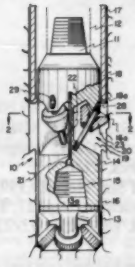
1. A rotary harrow comprising a frame having an elongated frame portion that extends transvese to the direction of travel, a plurality of soil working members being mounted on corresponding upwardly extending shafts and said shafts being journalled in said frame portion, said frame portion being hollow and having opposing upper and lower parts that are detachable from one another and fastening means securing said parts to one another, driving means housed within said hollow frame portion and engaging said shafts, the lateral ends of said frame portion comprising upwardly extending plates and said plates being secured to the lower part, at least one of said plates having an inwardly projecting rib that guides and positions one of the frame parts relative to the other frame part in assembled position, said upper and lower frame parts being substantially U-shaped in cross-section, with divergent limbs on a web, said projecting rib extending inwardly into the hollow frame portion and the web of said upper frame part resting on the top side of the rib.

4,141,421

UNDER REAMER

Benjamin R. Gardner, 4642 Idlewild Rd., Salt Lake City, Utah 84117

Filed Aug. 17, 1977, Ser. No. 825,290
Int. Cl.[2] E21B *9/28, 9/32*
U.S. Cl. 175—263 **8 Claims**



1. An under reamer tool comprising,

a cylindrical body;

coupling means for connecting said cylindrical body to a conventional drill string;

a plurality of uniformly spaced flutes formed within said cylindrical body;

cutting element means consisting of a cone-shaped cutter arranged within each of said flutes, said cutter having two cutter portions angularly disposed to each other, each cutter portion having an abrasive surface arranged thereon, the larger diameter end of said cone-shaped cutter extending under the urgings of centrifugal force when said under reamer tool is turned into contact with the wall of a well bore, each said cone-shaped cutter to retract, when said under reamer tool is lifted from the well bore, into a stowed attitude in said flute within the line of the outer wall of said cylindrical body;

shafts arranged across said uniformly spaced flutes each in an aslant attitude such that a cutter portion of said cone-shaped cutter journaled thereon, that is free to travel therealong, when in an extended attitude, will form more than a normal angle to said well bore wall; and

means for turning said cylindrical body.

4,141,422

VEHICLE, IN PARTICULAR TRACTOR

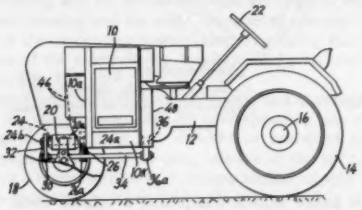
Ernst Hatz, Ruhstorf, Fed. Rep. of Germany, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,491

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638567

Int. Cl.² B62D *25/08, 49/00*

U.S. Cl. 180—1 F **7 Claims**



1. In a vehicle having a driving engine, in particular a tractor having front and rear wheels which are mounted on front and rear axles respectively, wherein the front axle is arranged movably about a horizontally positioned pivot pin, the improvement comprising wherein the one end of the pivot pin is supported in a bearing plate which is secured on a front wall of the driving engine, which front wall extends behind the bearing plate, and a front member is positioned at the other end of the pivot pin, with which front member are connected the ends of at least two rod-shaped force transmitting members, each of which extends through a guide bore in the bearing plate and is rigidly connected at the other end with a vehicle-fixed bearing projection.

4,141,423

VEHICLE SUSPENSION APPARATUS

Michael I. Cline, Morton, and Arthur E. Olt, Jr., Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 8, 1977, Ser. No. 814,235

Int. Cl.² B62D *55/00*; B60K *17/00*

U.S. Cl. 180—9.6 **10 Claims**

1. Vehicle suspension apparatus comprising:

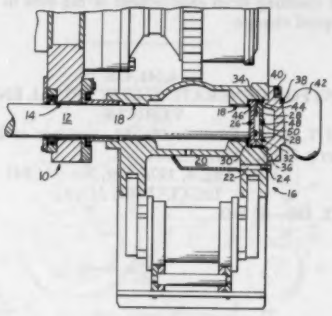
shaft means;

frame means mounted on the shaft means, and defining chamber means in which oil may be contained in the proximity of the shaft means;

a cap secured to the shaft means;

a retaining member secured to the frame means;

plate means positioned between the cap and retaining member, the retaining member, plate means and cap acting to retain the frame means on the shaft means; and



seal means operatively associated with the plate means for providing sealing relation between the plate means and frame means, for retaining oil contained in the chamber means.

4,141,424

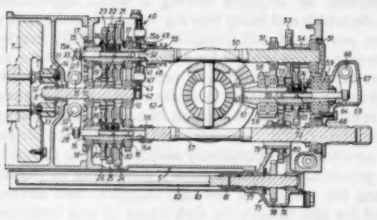
TRANSMISSION FOR TRACTORS

Yoshinobu Murayama; Kenzo Sada, and Mitsuhiro Kutomi, all of Sakai, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 28, 1976, Ser. No. 727,445

Int. Cl.² B60K *17/28, 17/08*

U.S. Cl. 180—53 CD **5 Claims**



1. A transmission of the three-system type for a tractor comprising an input system having a main input shaft carrying a plurality of gears for transmitting the torque of an engine, a propelling speed change system and a power takeof speed change system supported on the opposite sides of the input system respectively in parallel thereto, each of the propelling and power takeoff speed change system including a speed change shaft having a power output end and having a plurality of speed change gears freely rotatably mounted thereon side by side and meshing with the gears of the input system respectively at all times, the speed change shaft being a hollow shaft internally formed with an axial bore, each of the speed change gears being formed in its inner peripheral surface with grooves, the speed change shaft incorporating pins movable radially of the speed change shaft and engageable in and disengageable from the grooves in the corresponding speed change shaft and engageable and disengageable from the grooves in the corresponding speed change gear, the speed change shaft accomodating in its axial bore an axially movable speed change rod being axially movable to engage the pins in the grooves of the corresponding speed change gear and said speed change rod partially extending outwardly from said speed change shaft and operating force transmitting means provided at an end opposite to said power output end coupled to said partially extending portion of said speed change rod for axially moving said speed change rod whereby the speed change gear is coupled to the speed change shaft to transmit the torque to rear

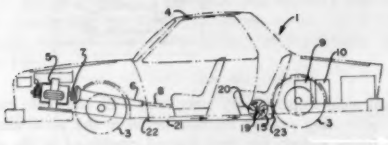
wheels and a power takeoff shaft with desired speed changes, and a flexible shock-absorbing coupling provided between the engine and the main input shaft, said coupling mediating the impact resulting from engagement of the pins in the grooves for a speed change.

4,141,425

MEANS FOR GENERATING ELECTRICAL ENERGY FOR VEHICLE

Russell T. Treat, Edwardsville, Ill., assignor to L. L. Payne, Beverly Hills, Calif.

Filed Aug. 4, 1976, Ser. No. 711,541
Int. Cl.[2] B60L *11/18*
U.S. Cl. 180—65 DD **35 Claims**



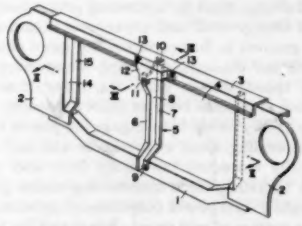
1. An electric powered vehicle incorporating both front and rear wheels, and having a bank of rechargeable batteries from which electrical energy necessary for vehicle operation is obtained, comprising an electric motor operatively associated with one of said front and rear wheels, said motor being energized by said batteries, gearing means interconnected with said motor means and being driven in rotation therefrom for inducing a rotation of the associated wheels, a vibrations absorbing coupler interconnected between said motor and gearing means to cushion the noises of vibration effected from the motor operations, an impellor having a width approximating the vehicle width and being bearing mounted to the said vehicle, a lower portion of said impellor being partially exposed at the underside of the vehicle for turning during vehicle movement under the influence of the air passing under said vehicle while minimizing the impellor resistance against vehicle movement, the remaining upward portion of said impellor being located within the vehicle framework and unexposed to the passing air, and an alternator operatively associated with the said impellor and provided for simultaneously generating an electric charge during the turning of the said impellor, said alternator provided for also selectively recharging of said batteries.

4,141,426

SUPPORT ASSEMBLY FOR RADIATORS AND AIR CONDITIONING CONDENSORS

Makoto Hamada; Shuji Miura, and Hiroyuki Watanabe, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 27, 1977, Ser. No. 791,572
Claims priority, application Japan, Dec. 23, 1976, 51/173326[U]
Int. Cl.[2] B60K *11/02*
U.S. Cl. 180—68 R **2 Claims**



1. A support assembly for side by side mounting of a radiator and an air conditioning condensor in a motor vehicle comprising:

a support frame having a central opening therein; and

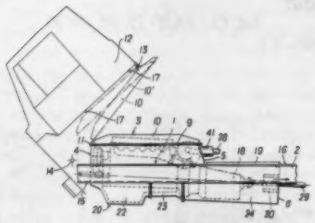
a center brace coupled to and vertically cutting across said support frame, said center brace having a crank shaped cross section formed by two parallel attachment faces projecting laterally to said opening in said support frame in opposite directions and a connecting member connecting said two attachment faces, said attachment faces being coupled to inboard sides of said radiator and said condensor such that one attachment face coupled to said radiator overlaps said condensor and the other attachment face coupled to said condensor overlaps said radiator whereby the area required to mount said radiator and condensor side by side in a motor vehicle is reduced.

4,141,427

MOTOR VEHICLE WITH A NOISE SUPPRESSING ENGINE ENCAPSULATION

Karl Kirchweger; Heinz Fachbach, and Gerhard Thien, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Sep. 2, 1977, Ser. No. 830,193
Claims priority, application Austria, Sep. 3, 1976, 6567/76; Jun. 27, 1977, 4552/77
Int. Cl.[2] B62D *25/00*
U.S. Cl. 180—69 R **17 Claims**



1. A motor vehicle comprising a vehicle frame which includes two longitudinal subframe beams having top and bottom rims; an internal combustion engine mounted on and between said subframe beams; a gearbox with transmission shaft connected to said engine and extending away therefrom between said beams; air intake and exhaust pipes connected to said engine and extending away therefrom between said beams; a fan-cooled water radiator connected to said engine; and a noise-suppressing engine encapsulation enclosing said engine, said encapsulation comprising a first transverse end wall mounted between said beams and in front of said engine so as to extend from the bottom rims of said beams to upwardly of said top rims to form a sealing edge; a second transverse end wall mounted between said beams and behind said gearbox so as to extend from the top rims of said beams to below said bottom rims, said second transverse end wall including an opening for a gearbox transmission shaft; longitudinal side walls positioned to connect said first and second transverse end walls, said side walls being substantially perpendicular to said end walls; a third transverse wall mounted between said beams and behind said engine and extending from the top rims of said beams upwardly thereabove to form a sealing edge, said side walls also connecting said first transverse end wall with said third transverse wall and having sealing edges connecting the sealing edges of said first and third transverse end walls; a movable cover part for enclosing the sealing edges of said first and third transverse walls and said side walls; a cover part extending between said side walls and connecting the lowermost portion of said third transverse wall with the uppermost portion of said second transverse end wall; and an oil sump cover means extending between said side walls and for con-

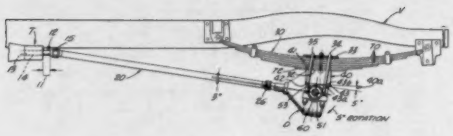
necting the lowermost portion of said first transverse end wall and the lowermost portion of said second transverse end wall.

4,141,428

REAR LIFT BLOCK

Thomas B. Loeb, 5257 Denny Ave., North Hollywood, Calif. 91601

Filed Jul. 28, 1977, Ser. No. 819,815
Int. Cl.[2] F16F *1/26*
U.S. Cl. 180—70 P **17 Claims**



1. In a vehicle having a frame, a rear axle, a drive shaft having its forward end adjustably supported from said frame and its rearward end operatively coupled through a differential to said axle, a housing for said axle, and a pair of rear suspension springs supporting the frame above the axle housing;

means for supporting the springs and the rearward end of the frame at a further elevated position above the axle but without substantially diminishing the operational effectiveness of the drive shaft, comprising:

a pair of rear lift blocks which have a larger vertical dimension at their rearward ends than at their forward ends;

means holding said lift blocks between the upper surface of the axle housing and the under surfaces of corresponding ones of the suspension springs, thereby placing the upper surface of the axle housing in nonparallel relationship to the springs; and

means associated with each of said blocks and interengaging both the axle housing and the corresponding one of the springs for inhibiting any forward or rearward sliding movement of the axle housing relative to the spring, including a recess formed in the upper surface of said block which receives a bolt carried by the spring, and an anchor pin extending from the lower surface of said block which engages an opening in the axle housing, said anchor pin being located nearer to the forward end of the block than is said recess;

said blocks, holding means, and inhibiting means cooperating to support the forward end of the drive shaft in a position substantially as far forward relative to the vehicle frame as it was prior to the further elevation of the springs and the rearward end of the frame, while also maintaining substantially the original angular position of the drive shaft relative to the differential.

4,141,429

TRACTOR CHASSIS AND CAB SUSPENSION SYSTEM

Richard A. Hale, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 15, 1978, Ser. No. 886,720
Int. Cl.[2] B62D *23/00*
U.S. Cl. 180—89.14 **10 Claims**

1. A tractor vehicle comprising:

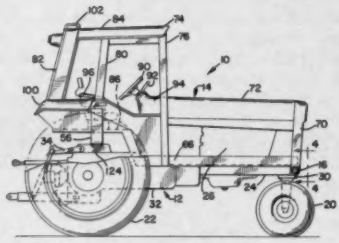
a subframe having a forward portion and a rear portion and having a plurality of wheels;

a superstructure including a frame, an operator's work station and an engine hood integrally carried on the superstructure frame which is pivotally mounted to the forward portion of the subframe;

a centering spreader having laterally projecting arms affixed to the subframe under the operator's work station;

a plurality of rollers supported on the laterally projecting arms of the centering spreader;

a pair of spaced apart vertical guide members projecting downwardly from the operator's work station adjacent the rollers of the centering spreader where the rollers contact the inboard surfaces of the vertical guide members;



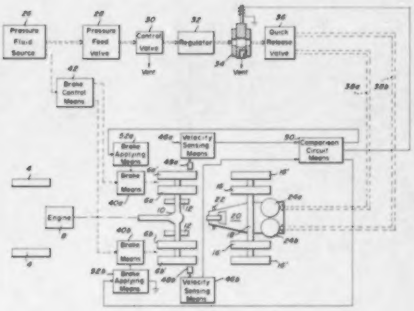
a suspension means mounted between the bottom of said operator's work station and the rear portion of the subframe.

4,141,430

SPEED-RESPONSIVE TAG AXLE CONTROL SYSTEM

William C. Eddy, Jr., Birmingham, Mich., assignor to Aspro, Inc., Westport, Conn.

Continuation-in-part of Ser. No. 704,128, Jul. 15, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,599
Int. Cl.[2] B60K *41/20*; B62D *61/12*
U.S. Cl. 180—105 E **15 Claims**



1. A traction control system for a motor vehicle including a chassis frame, comprising

(a) a pair of driven wheels connected by a differential mechanism, said driven wheels being arranged on opposite sides of the chassis frame;

(b) first means connecting said pair of driven wheels with said chassis frame to normally support a given portion of said frame relative to a fixed surface;

(c) a pair of non-driven wheels connected by an axle, said non-driven wheels being arranged on opposite sides of the chassis frame;

(d) second means connecting said pair of non-driven wheels with said chassis frame adjacent said pair of driven wheels;

(e) load transfer means connected with said chassis frame for transferring the vehicle load to and from said pair of driven wheels, respectively, said load transfer means including

(1) pressure fluid motor means connected between one of said pairs of wheels and said chassis frame;

(2) a source of fluid pressure; and

(3) fluid pressure control means controlling the supply of pressure fluid to and from said motor means;

(f) first and second brake means associated with said driven wheels, respectively;

(g) at least two velocity sensing means for generating velocity signal voltages that are a function of the instantaneous rotational velocities of said driven wheels, respectively; and

(h) comparison circuit means operable when one velocity signal voltage exceeds the other by a predetermined amount upon the overrunning of one driven wheel relative to the other for simultaneously;

(1) actuating the brake means associated with the faster driven wheel, and

(2) operating said fluid pressure control means to cause said load transfer means to transfer vehicle load to said driven wheels.

4,141,431

DETERMINATION OF FIRING TIMES OF ACOUSTIC PULSES

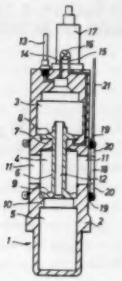
George C. Baird, Keston, England, assignor to Seismograph Service Corporation, Tulsa, Okla.

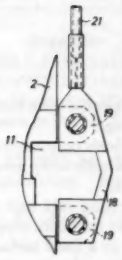
Filed Dec. 22, 1977, Ser. No. 863,260

Claims priority, application United Kingdom, Oct. 4, 1977, 41240/77

Int. Cl.[2] G01V *1/38*

U.S. Cl. 181—118 **9 Claims**





1. A marine gun for the production and timing of under water pulses comprising a body having an inlet for connection to a source of gas, at least one outlet port and means for controlling the discharge of gas under pressure through said port to produce an under water pulse, wherein said gun includes means for detecting the discharge of said gas, said detecting means including at least two electrodes both of which make electrical contact with the water surrounding the gun but are otherwise insulated from each other, wherein said electrodes form a gap in the path of the gas which is discharged from said port upon firing of the gun, such that firing of the gun produces an increase in the electrical resistance between said electrodes at the time of firing.

4,141,432

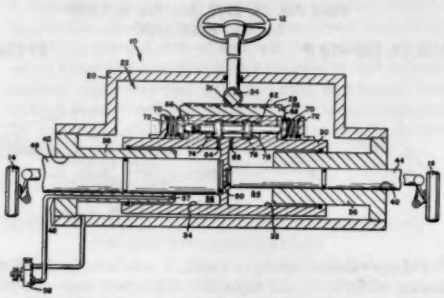
RACK AND PINION STEERING DEVICE

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 5, 1977, Ser. No. 839,677

Int. Cl.[2] B62D *5/10*

U.S. Cl. 180—148 **8 Claims**



5. A steering device comprising:

a housing defining a cavity and having an inlet port communicating with a pressure source;

a sleeve member disposed within said housing cavity, said sleeve member defining a pair of openings which are opposite each other, said openings having a common bottom wall forming a partition separating the pair of openings;

a valve member cooperating with said sleeve member to communicate the inlet port with said pair of openings via passage means in said sleeve member; and

a pair of rods fixedly secured to said sleeve member and extending outwardly from the pair of openings;

said housing including portions extending into said pair of openings and cooperating with said sleeve member and said pair of rods to define chambers which communicate with the inlet port, said valve member cooperating with passage means in said sleeve member to control communication between the inlet port and the chambers so that pressure communicated to said chambers causes said sleeve member and said pair of rods to move relative to said housing.

4,141,433

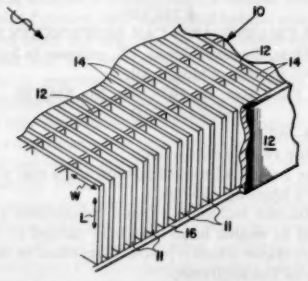
SOUND ABSORBING STRUCTURE

Glenn E. Warnaka, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jun. 4, 1976, Ser. No. 692,834

Int. Cl.[2] G10K *11/04*; E04B *1/99*

U.S. Cl. 181—286 **21 Claims**



1. A sound absorbing structure comprising

a plurality of parallel wall means that are (1) fabricated of a material which is generally impermeable to a fluid in which the sound absorbing structure is to be immersed, (2) substantially free of openings therethrough, (3) generally

lacking in sound absorbing capability, (4) acoustically reflective, and (5) laterally spaced a distance not more than one wavelength of a predetermined highest frequency to be absorbed, said wall means defining an array of side-by-side elongate fluid filled cavities with adjacent open ends of said cavities providing the sound-receiving end of the array, each of said cavities (1) having an uninterrupted dimension along said wall means greater than twice the spacing between said wall means, (2) having a length at least equal to one-fourth of the wavelength of the predetermined highest frequency to be absorbed, and (3) having a uniform cross section substantially throughout the length thereof, and

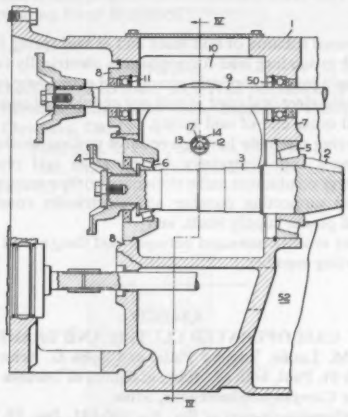
acoustically reflective barrier means disposed adjacent the ends of said cavities remote from the sound-receiving end thereof and terminating said cavities, the sound absorbing structure being free of any material adjacent to and extending over the sound-receiving end of said array of cavities, said cavities being uninterrupted between their sound-receiving ends and said barrier means.

4,141,434

LUBRICATION WAND FOR TRANSMISSION

Douglas W. Williams, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 20, 1976, Ser. No. 752,561
Int. Cl.² F01M *1/08*
U.S. Cl. 184—6.12 **10 Claims**



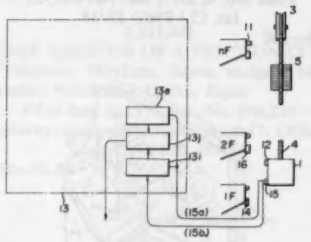
1. A lubrication wand for lubricating a compartment in a power train adapted for connection to a forced hydraulic lubrication system in a transmission comprising, a housing including fore and aft walls defining a compartment, a drive system consisting of a drive shaft extending through said compartment, at least one bearing mounted in each wall of said housing rotatably supporting said drive shaft, a lubrication wand mounted in said housing and extending into said compartment including, a tubular structure extending into the said compartment, means defining a plurality of spray openings angularly spaced about the periphery of said tubular structure and positioned in alignment with said shaft for providing a peripheral spray spraying lubricant directly on said shaft and bearings, a fitting connected to the external end of said tubular structure forming a continuous passage through said tubular structure and fitting, a threaded portion on the external periphery of said fitting, a threaded opening in said housing receiving said threaded fitting for mounting said wand for spraying lubrication on said shaft and bearings, fastening means removably fastening said fitting on said housing, a connection on said fitting adapted for connection to an external conduit of the hydraulic lubricating system to provide forced lubrication and cooling of said bearings.

4,141,435

ELEVATOR CONTROL SYSTEM

Tsuyoshi Satoh, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,920
Claims priority, application Japan, Oct. 28, 1976, 51-129707
Int. Cl.² B66B *5/00*
U.S. Cl. 187—29 R **2 Claims**



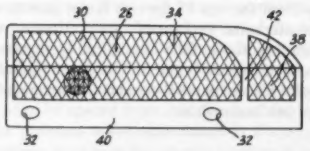
1. An elevator control system using an electric type floor selector comprises: a unit provided at at least one of the specific floors in the hoistway and indicating the specific floor; units provided at the other floors than said specific floors and for indicating merely the floor; a detecting means provided at a car in which presence of both units is detected and, when said detector levels with said respective units, said detector generates a signal corresponding to it; a floor indicator for indicating the floor at which the car actually stops by using the detected signal; and a stop permissible floor indicator for indicating the electrically calculated stop floor when the car stops, in which comparison is made of the output of said floor indicator with the output of said stop permissible floor indicator; when these outputs are different, the car is moved to the specific floor and, when the car stops at the specific floor, said floor indicator and said stop permissible floor indicator are set to said specific floor.

4,141,436

DISC BRAKE AND A GUIDE KEY FOR THE SAME

Yves Meyer, Taverny, France, assignor to Societe Anonyme DBA, Paris, France

Continuation of Ser. No. 771,868, Feb. 25, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,185
Claims priority, application France, Mar. 16, 1976, 76 07458
Int. Cl.² F16D *55/00*
U.S. Cl. 188—71.1 **1 Claim**



1. In a disc brake having a caliper member straddling a rotary disc and moving relative to the disc on two circumferentially spaced surfaces of a fixed member, at least one guide key cooperating with the caliper member and fixed member to provide for movement therebetween, brake applying means cooperating with the caliper member so as to urge a first friction pad and a second friction pad into engagement with the disc, to retard rotation of the latter and the guide key defining a surface which slidably cooperates with one of the members, the improvement wherein the guide key surface forms more than one assembly of relatively small surfaces, said surfaces being separated from each other by interconnecting grooves, and said guide key surface including a smooth continuous

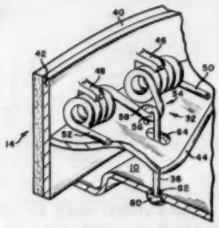
surface free of recesses, said smooth continuous surface enclosing more than one assembly of relatively small surfaces and separating each assembly from the other assembly.

4,141,437

SHOE HOLD-DOWN SPRING FOR A DRUM BRAKE

James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 6, 1977, Ser. No. 830,952
Int. Cl.[2] F16D *51/18*
U.S. Cl. 188—340 **1 Claim**



1. In a drum brake having a backing plate supporting a pair of brake shoes, each of the brake shoes including a web and a rim with a friction lining attached to the rim, an actuator cooperating with the pair of brake shoes to move the latter to a braking position and resilient means cooperating with the backing plate and at least one of the pair of brake shoes to maintain the latter in juxtaposition to the backing plate, the improvement wherein said resilient means comprises a coil spring engaging the one brake shoe and a finger member extending from the backing plate and projecting through an opening in said web, said coil spring including a pair of projections extending from opposite ends of said coil spring and engaging the web of the one brake shoe, and a pair of coiled portions having axes extending generally parallel to the plane of said web, said coiled portions defining an outer circumferential surface of said coil spring, and a loop joining said coiled portions and projecting tangentially from said outer circumferential surface, said loop releasably locking with said finger member to impart rotational tension to said coil spring to torque siad coiled portions to bias said end projections into engagement with the web of the one brake shoe to resiliently oppose separation of the one brake shoe away from the backing plate, said finger member cooperating with said loop to limit separation of the one brake shoe away from the backing plate, the rim of the one brake shoe including tabs extending outwardly from the rim of the one brake shoe to engage said outer circumferential surface of said coil spring to hold said outer circumferential surface of said coil spring in engagement with the web of the one brake shoe and said tabs also retaining said end projections parallel to and in engagement with the web of the one brake shoe.

4,141,438

RETRACTABLE CORD REEL

Clarence J. Diem, Evergreen Park, R.R. #2, Davenport, Iowa 52804

Continuation-in-part of Ser. No. 756,019, Jan. 3, 1977, abandoned. This application Nov. 18, 1977, Ser. No. 852,709
Int. Cl.[2] H02G *11/02*
U.S. Cl. 191—12.4 **6 Claims**

1. A reel assembly comprising:

first and second flanges connected together,

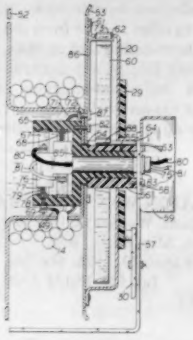
an electrical cord to be wound between said flanges, said cord having one end connected to said flanges and having a plurality of power conductors and a grounding conductor,

a plurality of power supply leads and a grounding lead for appliances that utilize power,

a stationary arbor, said arbor having one end with mounting means, a rigid supporting member, said mounting means connected to said rigid supporting member for providing full support for said arbor,

means for rotatively mounting said first and second flanges coaxially on said arbor,

a flat spiral electrically conductive spring having sufficient strength to retract said cord, said spring having an inner end with a turn about said arbor and an outer end connected to said first flange, said arbor having means to



prevent rotation of said inner end as said spring is wound, said grounding lead for appliances electrically connected to said inner end of said spring, said grounding conductor of said electrical cord at said one end thereof connected to said outer end of said spring,

a slip-ring assembly having a rotative portion secured to said flanges and electrically connected to said plurality of power conductors and a stationary portion secured to said rigid supporting member and electrically connected to said power supply leads, and

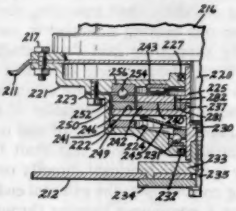
ratchet means connected between said flanges and said supporting member.

4,141,439

CAM OPERATED CLUTCH AND BRAKE

James M. Lunde, Taylors Falls, and John G. Schwartz, Jr., South St. Paul, both of Minn., assignors to Osceola Clutch & Brake Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 650,041, Jan. 19, 1976, abandoned. This application Nov. 26, 1976, Ser. No. 745,232
Int. Cl.[2] A01D *55/18;* F16D *67/02*
U.S. Cl. 192—18 R **8 Claims**



1. Means for controlling the transmission of power from a source such as an engine to a use element such as a rotating blade, comprising, in combination:

a driving member mounted for rotation about an axis with respect to a stationary housing, and having an inward clutching surface;

a driven member mounted for rotation about and limited

translation along said axis and having an inward clutching surface apposed to said surface of said driving member;

a first friction member freely rotatable about said axis for engagement by said clutching surfaces;

resilient means normally urging said driven member toward said driving member to bring about power transmission from said driving member through said first friction member to said driven member;

a second friction member freely rotatable about said axis to engage a further portion of said clutching surface of said driven member;

control means including a first portion fixed with respect to said housing and a second portion pivotable about said axis, in apposition to said second friction member, between a first position in which it applies force through said second friction member to displace said driven member axially away from said driving member against the action of said resilient means, disabling the power transmission and causing braking of said driven member, and a second position, in which it applies substantially no force through said second friction member, enabling the power transmission, the direction of pivotal movement of said second portion from said second position to said first position being the same as the direction of rotation of said driven member;

second overriding resilient means normally pivoting said control means into said first position in opposition to the effect of said first resilient means;

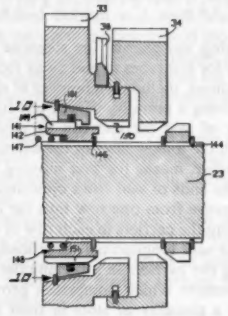
and means manually operable to pivot said control means into said second position and maintain it there only so long as operating force is applied.

4,141,440

BLOCKER AND JAW CLUTCH ASSEMBLY

Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 2, 1977, Ser. No. 802,684
Int. Cl.[2] F16H *3/38;* F16D *13/00*
U.S. Cl. 192—53 F **12 Claims**



1. An improved blocker of the type comprising a substantially nondeformable blocker ring rotationally carried by a first of two axially engageable positive clutch members, said blocker ring having a limited degree of rotation relative to said first clutch member and at initiation of a clutch engaging operation operable to tend to rotate with said second clutch member, said blocker effective to sense nonsynchronous rotation of said clutch members corresponding to certain blocker ring rotation relative to said first clutch member to block relative axial engagement of said clutch members, the improvement comprising:

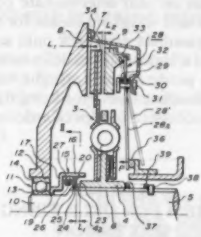
said blocker being effective to sense a first type of nonsynchronous condition wherein one of the clutch members rotates in a given direction faster than the other clutch member but ineffective to sense a second type of nonsynchronous condition wherein the other clutch member rotates in said given direction faster than the one clutch member.

4,141,441

RELEASE ASSISTOR OF A FRICTION CLUTCH

Yasunobu Fukatani, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jun. 3, 1977, Ser. No. 803,239
Claims priority, application Japan, Aug. 17, 1976, 51-98411
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—70.25 **5 Claims**



1. A release assistor for a friction clutch, comprising:

a rotatable flywheel;

a main drive shaft having splines thereon;

a pilot bearing for rotatably supporting said drive shaft in the center of said flywheel;

a clutch disc adapted to rotate with said drive shaft;

a pressure plate rotatable with said flywheel and adapted to press said clutch disc into frictional contact with said flywheel;

an annular hub for connecting said clutch disc to said drive shaft, said hub operatively engaging said splines to cause said hub to rotate with said drive shaft and to permit said hub to move axially relative to said drive shaft, said hub including an annular shoulder on the end thereof nearest to said flywheel, and an integral portion adjacent said shoulder, having an outside diameter less than the diameter of the periphery of said shoulder;

an annular casing overlying said integral portion and spaced therefrom, said casing being connected to supporting means associated with said drive shaft; a pawl member interposed between said casing and said integral portion adapted to contact said shoulder when the clutch is engaged and to be spaced from said the shoulder by a predetermined distance when the clutch is disengaged, said pawl member engaging the interior surface of said casing and being axially movable relative to said casing only in a direction towards said flywheel;

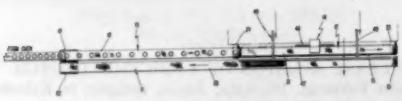
biasing means engaging an end surface of said integral portion for causing said hub to move axially away from said flywheel, and adapted to contact said pawl member when said clutch is disengaged, said biasing means including a plurality of belleville springs and a shim interposed between each of said springs; and

a spring supported on said drive shaft and engaging a surface of said hub to limit the axial movement of said hub during disengagement of the clutch, said spring applying a force to said hub which is less than the force applied by said biasing means.

4,141,442
APPARATUS FOR SEPARATING ARTICLES INTO GROUPS BY WEIGHT

Albert V. Cole, Houston, Tex., and Arthur F. Morton, Portland, Oreg., assignors to Nabisco, Inc., East Hanover, N.J.

Filed Oct. 20, 1977, Ser. No. 843,807
Int. Cl.[2] B65G *43/08, 69/00;* G01G *13/00*
U.S. Cl. 198—429 5 Claims

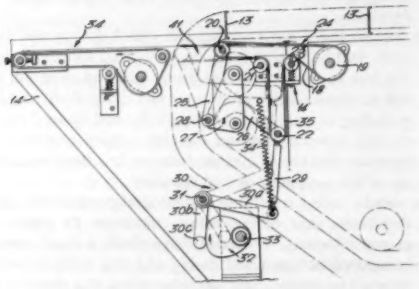


1. Apparatus for separating a column of articles of non-uniform weight into groups of equal weight comprising an infeed conveyor, an outflow conveyor, an intermediate conveyor for receiving articles from the infeed conveyor and positioned side by side with said outflow conveyor, means for weighing the articles on said intermediate conveyor, pusher means responsive to said weighing means for sliding all of the articles on said intermediate conveyor onto said outflow conveyor when the total weight of the articles on said intermediate conveyor reaches a predetermined weight, said outflow conveyor and said intermediate conveyor being driven at different velocities to space successive groups of articles on said outfeed conveyor.

4,141,443
CONVEYOR SYSTEM FOR DELIVERING ARTICLES IN SUCCESSION

Arthur E. Halsey, Horsham, England, assignor to Vacuumatic Limited, Harwichm, England

Filed Jul. 21, 1976, Ser. No. 707,688
Claims priority, application United Kingdom, Jul. 30, 1975, 31860/75
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] B65G *47/74*
U.S. Cl. 198—471 6 Claims



1. A conveying apparatus comprising:

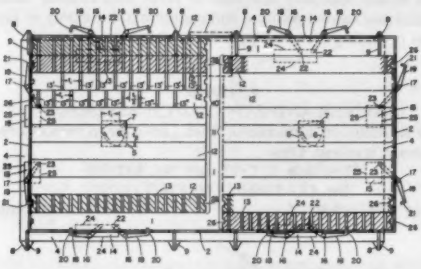
a first conveyor system having a stationary horizontally extending article support surface, article displacement elements, means for mounting the article displacement elements at spaced locations around an endless path, part of which extends along the article support surface, and means for driving the article displacement elements around the closed path to sweep over the article support surface to displace articles along the article support surface; and,

a second conveyor system comprising an endless conveyor loop, means for guiding the loop around a closed path, including a horizontally extending run, means for driving the endless loop about the closed path, and means for cyclically extending and retracting the horizontal run of the closed path at one end thereof into and out of an article discharge position, the second conveyor system being located adjacent the downstream end of the first conveyor system with the horizontally extending article surface thereof in general alignment with the horizontally extending run of the second conveyor system, a third conveyor system wherein the downstream end of the horizontally extending run of the second conveyor system and the upstream end of the third conveyor system define a space in a common plane when the horizontally extending run of the second conveyor system is in its retracted position; and means for coupling the cylically operating means in timed relation with the drive means of the first conveyor system whereby the one end of the second conveyor system is retracted to admit an article displacement element on the first conveyor system to pass through the space and then to extend across the space until the next article displacement element approaches the common plane.

4,141,444
CAM AND LEVER BASED SAMPLE TRANSPORT

Gerardus H. Kulberg, Noorden; Jakob Feiken, Nieuwveen, and Siebe A. Freek, Zaandam, all of Netherlands, assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,779
Int. Cl.[2] B65G *35/08*
U.S. Cl. 198—472 16 Claims



1. In a conveying mechanism for stepwise movement of elongated carriers for test tubes to and away from a station for measuring or treatment, including a number of elongated carriers, each for receiving a plurality of said test tubes, a table on which a plurality of said carriers can be positioned in two parallel rows, with the longer sides of the carriers in each row along side each other, means for first moving the carriers at diagonally opposite ends of said rows oppositely in longitudinal directions stepwise from one row into the other row, and for secondly moving the carriers in each row in opposite directions transverse to said longitudinal directions, whereby said means for moving the carriers in a rectangular path over the table, the improvement which comprises: providing each of the carriers with a plurality of slots in their lower surfaces extending transversely to the longitudinal direction of the carriers; said means for moving the carriers in the longitudinal direction and perpendicularly thereto being comprised of a plurality of mutually rigidly connected projections, insertable into the slots of said carriers, said moving projections being provided in two linear rows, each row being parallel to the longitudinal direction of the carriers on the table, said rows being generally spaced by a distance equal to the length of each row of carriers on the table, less the width of a carrier; driving means for moving said projections in a rectangular path in two longitudinal strokes and two transverse strokes to engage the slot of one end carrier at the end of one row, move said carrier incrementally longitudinally toward the other row, the diagonally opposite other end carrier on said table being conveyed similarly, said slots being spaced relative to each other and said projections so that upon said end carriers being fully aligned with their new rows, said projections engage non-slotted por-

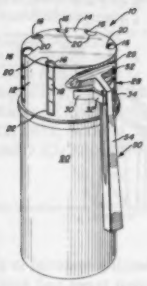
tions of said end carriers and moves the same transversely to said longitudinal direction to thereby position subsequent carriers to repeat the cycle.

4,141,445

BLADE CARTRIDGE STORAGE CAP AND RAZOR HOLDER

George P. Korich, 8604 E. Old Spanish Trail, Tucson, Ariz. 85710

Continuation-in-part of Ser. No. 653,967, Jan. 28, 1976, abandoned. This application Apr. 19, 1977, Ser. No. 788,815
Int. Cl.[2] B65D *16/00*
U.S. Cl. 206—228 10 Claims



1. A cap for enclosing a shaving cream can constructed to accommodate a plurality of blade cartridges and a blade cartridge razor, comprising in combination,

a cap adapted for removable positioning atop the shaving cream can,

said cap being formed by a peripheral side wall and having a closed top and an open bottom,

said cap including at least one holding means formed integrally therewith for removably holding a blade cartridge therein,

said holding means being formed by a vertically extending lock slot formed in said peripheral side wall, said slot having a closed bottom and open top, said open top formed as a cut-away portion in said top of said cap such that a blade cartridge may be vertically positioned within said slot through said cut-away open top end thereof, and said blade cartridge may be removably positioned within said vertically extending slot,

said peripheral side wall of said cap being further provided with retention means formed integrally therewith for retaining a blade cartridge razor in disengageable engagement therein,

and said cap including said holding means and said retention means being entirely removable from the shaving cream can while simultaneously adapted to hold said blade cartridge and retain said blade cartridge razor when in a removed position.

4,141,446

TAPE CASSETTES STORAGE AND DISPLAY

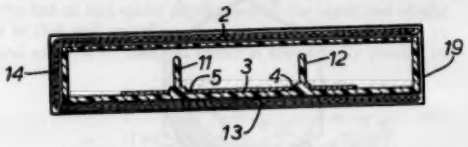
Ian Cliffe, Crawley, England, assignor to Garrod and Lofthouse Limited, London, England

Continuation-in-part of Ser. No. 801,918, May 31, 1977. This application Jun. 22, 1977, Ser. No. 808,957
Claims priority, application United Kingdom, Jun. 22, 1976, 25893/76; Jan. 17, 1977, 1794/77; Jan. 28, 1977, 3670/77
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—387 24 Claims

1. The combination of a box for a product and a device for storage and/or display of said box;

said box comprising a base, a lid, means pivotally mounting said lid relative to said base, means defining a slit in the plane of said base, and a stud projecting from said base inwardly of said box;

said device comprising a base part overlying the outer surface of said base of said box and a flap extending from said base part into said box through said slit, said flap overlying



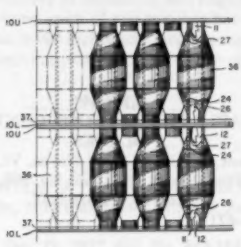
the inner surface of said base of said box and having an opening therein engaged over said stud to retain said flap within said box and in a position clear of said lid so as to permit opening of said box by pivoting of said lid relative to said base.

4,141,447

TRAY SUPPORT FOR SHIPPING WOUND MATERIAL PACKAGES

Russell L. Anderson, Mechanicsburg, Pa., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Filed Mar. 10, 1978, Ser. No. 885,406
Int. Cl.[2] B65D *85/676*
U.S. Cl. 206—392 13 Claims



1. A post tray article for mounting aligned and spaced pirns and bobbins bearing wound materials comprising:

(a) a single one-piece flat, rigid base sheet, and

(b) a plurality of spaced pairs of outwardly extendable mating members formed in the single base sheet defined by cuts and a single scored line at the base of each member, the scored lines of mating members being spaced from, and arranged perpendicularly to each other so that upon folding mating members outwardly of the base sheet along their scored bases into positions substantially perpendicular to the base sheet, the mating members are in planes at substantially right angles to each other and interlock to form a rigid, supporting post integral with said base sheet.

4,141,448

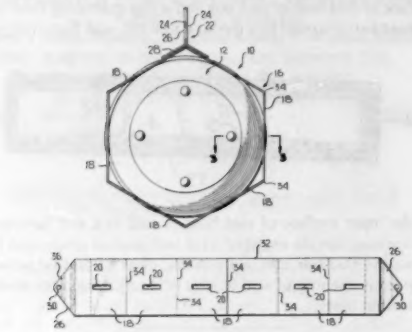
INTEGRATED DOUBLE SERVING PACKAGES WITH HANGER

Carmen T. Mascia, Clarendon Hills, and Thomas F. Jordan, Oak Park, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Feb. 14, 1978, Ser. No. 878,182
Int. Cl.[2] B65D *65/22, 75/24*
U.S. Cl. 206—485 15 Claims

1. A container package comprising a pair of containers disposed in end-to-end relation, each of said containers having a peripheral projection at a respective one of said ends, and retaining sleeve telescoped over said containers and extending about said containers in a peripheral direction, said retaining

sleeve being of a generally polygonal section including a plurality of flat panels, and a notch fully in each of said flat panels



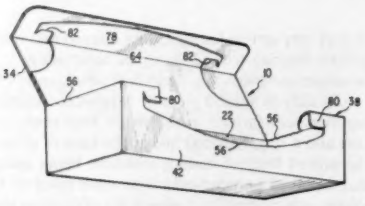
having said container peripheral projections extending therethrough in interlocked relation.

4,141,449

RECLOSEABLE PILFER-PROOF CONTAINER AND BLANKS

Orison W. Stone, R.F.D. #1, New Haven, Vt. 05472

Filed Jun. 9, 1977, Ser. No. 805,174
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—621 **7 Claims**



1. A pilfer-proof, recloseable container formed from a single blank of foldable sheet material, including:

a hexahedral container base having an open, curved line of separable perforations on two adjacent faces thereof defining an access flap, a locking tab on one side of the line of perforations, and a locking edge on the other side of the lines of perforations; and,

a lid portion integral with said hexahedral container base, said lid portion being attached in face to face relationship to a portion of said access flap,

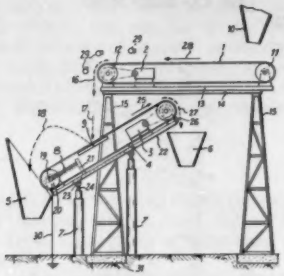
whereby, when the container is initially opened, the line of perforations is severed to release the access flap, whereby after the initial opening of the container, the access flap and said lid portion together define a double-layered closure member for the container which is pivotable as a unit and whereby, when the container is reclosed, said locking tab mates with said locking edge to assist in holding said lid portion and said access flap in a closed position.

4,141,450

METHOD AND APPARATUS FOR SORTING MIXTURES OF MATERIALS BY BALLISTIC EFFECT AND DIFFERENTIAL ADHERENCE

Francois H. Clin; Jean-Noel M. Gony, both of Orleans, and François O. Proust, Olivet, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Mar. 23, 1977, Ser. No. 780,397
Claims priority, application France, Mar. 24, 1976, 76 08527
Int. Cl.[2] B07C *5/02, 9/00*
U.S. Cl. 209—3.1 **10 Claims**



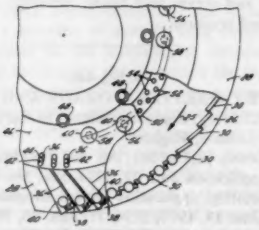
1. A method for sorting material in a heterogeneous mixture of materials of different types and forms and having a particle size and rigidity distribution extending over a wide range comprising conveying said heterogeneous mixture of materials at a predetermined speed along a substantially horizontal conveyor, discharging said material from the end of said conveyor onto an inclined conveyor having the higher end thereof disposed beneath said horizontal conveyor, collecting the materials which do not adhere to the inclined conveyor in a container adjacent the lower end of the inclined conveyor, conveying the materials which adhere to said inclined conveyor upwardly in a direction having a horizontal component of movement opposite to the horizontal component of movement of said substantially horizontal conveyor and having a vertical component of movement substantially opposite to the direction of fall of the materials discharged from the end of said horizontal conveyor and collecting the materials discharged from the higher end of said inclined conveyor.

4,141,451

CHIP THICKNESS CLASSIFIER

Joseph A. Lapointe, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Jan. 4, 1978, Ser. No. 866,838
Int. Cl.[2] B07C *5/04*
U.S. Cl. 209—664 **9 Claims**



1. A chip thickness classifier comprising a drum mounted for rotation about its longitudinal axis, a plurality of discrete longitudinally extending bars of elongated cross-section arranged to extend substantially longitudinally of and to form the circumference of said drum, each of said bars being mounted for

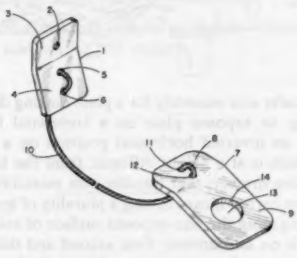
rotation about a longitudinally extending axis of said bar, said bars being positioned in substantially shingled relationship with one side of each said bar radially spaced inwardly of the other side of its immediately adjacent bar thereby to form outlet passages between adjacent bars, said outlet passages being in the form of slots extending longitudinally of said drum and having their maximum width measured substantially radially relative to said axis of said drum, an adjustment mechanism, means interconnecting each of said bars with said adjustment mechanism for simultaneous incremental rotational movement of all of said bars about their said longitudinally extending axes by said adjustment mechanism thereby to stepwise rotate said bars and adjust said width of said outlet passages between each pair of adjacent said bars and latch means to lock said adjustment mechanism in an adjusted position.

4,141,452

TOOL HANGER

Joe L. Martin, 2038 Palm, #132, Las Vegas, Nev. 89104, and Jerry D. Martin, 502 Kump St., Bonner Springs, Kans. 66012

Filed Dec. 22, 1977, Ser. No. 863,418
Int. Cl.² B65D *85/20*; A47F *7/03*
U.S. Cl. 211—60 T **5 Claims**



1. A hanger for holding implements having elongated handles comprises

mounting means,

a gripping member comprising a rigid frame, an aperture in said frame, a resilient rubber grommet mounted in said aperture for holding an elongated handle in said aperture, said gripping member comprising a gripping portion containing the aperture and a flange portion extending from the gripping portion at an angle of from about 10° to about 35°, and the flange portion comprises attachment means for securing the flexible connecting means to the gripping member

flexible connecting means for attaching the mounting means to the gripping member, and

adjustment means for varying the length of the flexible connecting means.

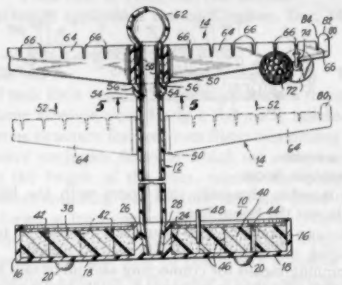
4,141,453

EARRING DISPLAY RACK

Abraham Hanan, P.O. Box 88 G.P.O., New York, N.Y. 10001

Filed Oct. 11, 1977, Ser. No. 841,021
Int. Cl.² A47F *7/02*
U.S. Cl. 211—163 **53 Claims**

1. An earring display rack comprising a base member, a rectilinear post, means mounting one end of said post substantially at the center of said base member, said means comprising a tapered recess at the center of the base member, together with a tapered terminus at the one end of the post, so that said post is erect and substantially perpendicular to said base member, said tapered recess in the base member being at a central hub in the base member, the base member having a plurality of upper recesses defined by a plurality of radial baffles, each of said radial baffles extending from said central hub in the base member to a peripheral upper baffle at the outer edge of the base member, so that a plurality of sector-shaped upper recesses are provided in the upper surface of the base member, each sector-shaped upper recess being defined by two adjacent radial baffles and a portion of said peripheral upper baffle, and a spider constituting a hub and a plurality of spokes extending radially outwards from the hub, means freely rotatably mounting the hub of said spider proximately to the upper end of said post so that said spider can be turned on said post about its central axis and so that said spider is substantially parallel to



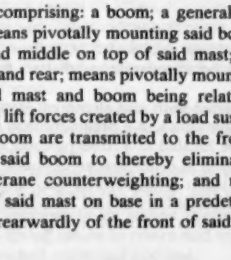
said base member, each of said spokes being evenly tapered from a wide inner end to a narrow outer end, with the upper edge of each spoke which is spaced away from said base member being substantially perpendicular to said post, each of said spokes having a plurality of notches in said edge and mutually spaced along the same, each of said notches having an upper gap less than about 0.100 inches and large enough to at least accommodate an earring post or clasp or wire of an earring.

4,141,454

CRANE WITH "Z" CONFIGURED BOOM

Willard B. Long, Jr., 1011 Fairground Dr., #12, Salisbury, Md. 21801

Filed Oct. 18, 1977, Ser. No. 843,213
Int. Cl.² B66C *23/00*
U.S. Cl. 212—8 R **6 Claims**



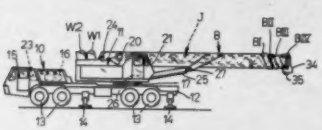
1. A crane comprising: a boom; a generally vertically disposed mast; means pivotally mounting said boom intermediate its rear end and middle on top of said mast; a platform base having a front and rear; means pivotally mounting said mast on said base; said mast and boom being relatively articulated whereby crane lift forces created by a load suspended from the front of said boom are transmitted to the front of said crane base, beneath said boom to thereby eliminate the need for conventional crane counterweighting; and means fixing the relationship of said mast on base in a predetermined angular attitude tilted rearwardly of the front of said base.

4,141,455

MEANS FOR STORING AND CONNECTING JIB ON TELESCOPIC CRANE BOOM

Francis A. Henderson, Cedar Rapids, and Roger M. Wolfe, Toddville, both of Iowa, assignors to Harnischfeger Corporation, Milwaukee, Wis.

Filed Jul. 14, 1977, Ser. No. 815,561
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—55 **18 Claims**



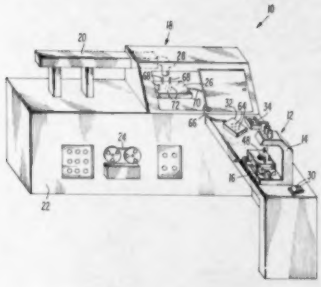
1. In a crane:
a telescopic boom;
a jib storable alongside said boom with the jib base end adjacent the boom head;
jib storage means on said boom and on said jib to facilitate storing and installing said jib on said boom;
and pinning means for connecting said jib to said boom head so that said jib can be moved axially between stored and unstored positions alongside said boom, swung horizontally between said unstored position and an installed position in axial alignment with said boom, and secured in said installed position, said pinning means including pin-receiving members on said boom head, manually movable self-storing releasable pins on said jib base end, and a crank-engaging member for moving said pins, one of said pins having a bore therethrough for receiving a crank which is engageable with said crank-engaging member.

4,141,456

APPARATUS AND METHOD FOR ALIGNING WAFERS

Lewis F. Hart, Bridgewater, N.J., assignor to RCA Corp., New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,825
Int. Cl.[2] B65G *47/90*
U.S. Cl. 214—1 R **11 Claims**



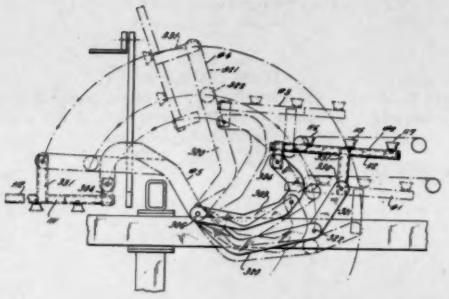
1. An apparatus for aligning wafers comprising:
(a) an alignment station including means for contacting and selectively holding a wafer in a fixed position;
(b) a transfer chuck including means for contacting and selectively holding said wafer in a fixed position, said transfer chuck being separate and distinct from said alignment station;
(c) means associated with said alignment station for receiving said transfer chuck in a predetermined orientation;
(d) a microscope located in a fixed position relative to said alignment station in order that an operator will view and then align a wafer positioned at said alignment station relative to reference lines in said microscope; and
(e) a remote operation station including means for contacting and selectively holding said wafer in a fixed position as well as means for receiving said transfer chuck in a predetermined orientation.

4,141,457

TRANSFER ARM ASSEMBLY FOR PLATE MAKING SYSTEM

Stanley J. Nocek, Clifton, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,981
Int. Cl.[2] B66C *1/02*; B65G *47/24*
U.S. Cl. 214—1 BV **10 Claims**



1. A transfer arm assembly for a plate making device and for transferring an exposed plate on a horizontal film negative drawer to an inverted horizontal position on a belt transfer system which is at a height different from the height of said film negative drawer; said transfer arm assembly comprising vacuum cup carrier means having a plurality of spaced vacuum cups for engaging the non-exposed surface of said plate when said plate is on said drawer; first, second and third links each pivotally mounted on a common driven shaft; said first and second links being connected to said common shaft and being rotatable therewith; said third link being rotatable relative to said common shaft; latch means for latching said second and third links to force said third link to rotate with said second link when said latch means is engaged; first pivotal connections means for pivotally connecting said first link to said vacuum cup carrier means at a first location thereon, and second pivotal connection means for pivotally connecting said third link to said vacuum cup carrier means at a second location thereon; and latch defeating means for defeating said latch means before said vacuum cup carrier means reaches the level of said belt transfer system, whereby said vacuum cup carrier means can rotate on a reduced radius.

4,141,458

WAFER TRANSPORT SYSTEM

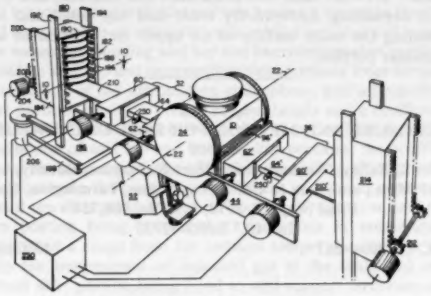
Norman B. Brooks, Carlisle, and Michael M. Olmstead, Bedford, both of Mass., assignors to Pass-Port Systems Corporation, Billerica, Mass.

Division of Ser. No. 580,350, May 23, 1975, Pat. No. 4,030,622. This application May 23, 1977, Ser. No. 799,547
Int. Cl.[2] B65B *21/02*; B65G *1/06*
U.S. Cl. 214—301 **9 Claims**

1. A loader/unloader for wafers, comprising:
A. a cassette for holding a plurality of wafers thereon in spacd apart position, and having an open face through which said wafers may be removed from, or supplied to, said cassette;
B. said cassette including at least first and second side walls having ribs on the interior surfaces thereof for supporting the wafers thereon and spaced apart in a vertical direction by an amount at least slightly greater than the thickness of the wafer to be stored therein;
C. a tongue extensible into said face and between said wa-

fers, said tongue having a portion adapted to convey said wafers away from or to said cassette;

D. the ribs on opposed side walls of the cassette being spaced apart at an amount sufficient to accommodate passage of said tongue therebetween;



E. means bringing said tongue into contact with said wafers; and

F. means vibrating said tongue to thereby transfer wafers between said tongue and cassette.

4,141,459

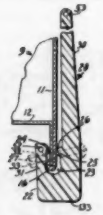
PROTECTING DEVICE FOR CONTAINERS

John C. Eli, Jr., 1476 Smiley Heights Dr., Redlands, Calif. 92373

Filed Dec. 27, 1977, Ser. No. 864,526

Int. Cl.[2] B65D *25/00, 7/42*

U.S. Cl. 220—85 K **9 Claims**



1. A reinforcing device for a container having a rim at one end thereof which comprises a yieldable strip forming a reinforcing member adapted to surround said container, said member having a reverse bend section adjacent one side edge thereof, said reverse bend section forming a groove adapted to receive said rim to reinforce said rim, said strip including a pair of locking shoulders extending in facing directions into said groove, one of said locking shoulders interlocking said container rim, and the other of said locking shoulders spacing said container from said reinforcing member; the remainder of said member forming a protective skirt for an adjacent portion of said container.

4,141,460

FIRE PROTECTION MEANS COMPRISING A NON-WOVEN FIBROUS STRUCTURE OF THERMALLY BONDED CONJUGATE FIBERS

Harold P. Stanistreet, Harrogate, England, and Peter F. Jowitt, c/o Procurement Executive, Ministry of Defence, London, England, assignors to Imperial Chemical Industries Limited and Peter Frederick Jowitt, both of London, England

Filed Dec. 8, 1977, Ser. No. 859,109

Claims priority, application United Kingdom, Dec. 14, 1976, 52077/76

Int. Cl.[2] B67D *5/60*

U.S. Cl. 220—88 A **1 Claim**

1. A fuel tank for a vehicle containing therein a flame arrestor, said flame arrestor, comprising a thermally bonded, non-woven fibrous structure formed from fibers comprising potentially adhesive conjugate fibers in which the components extend along the length of the fiber, one of the components having a lower softening temperature than the other components and forms at least part of the peripheral surface of the fiber wherein the non-woven fibrous structure is formed from fibers comprising at least 90% of potentially adhesive conjugate fibers having a decitex in the range 6 to 35, the non-woven fibrous structure having a density of not more than 16 g per liter and a surface area of at least 0.35 m^2 per liter, the fibers in the fibrous structure being thermally bonded to at least one other fiber.

4,141,461

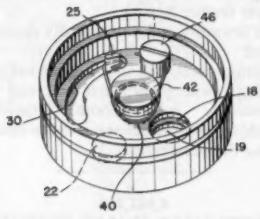
SECURE BOTTLE WITH NOVEL CAP

Ernest J. LaChance, Old Wilton Rd., Milford, N.H. 03055

Filed Jan. 31, 1978, Ser. No. 873,871

Int. Cl.[2] B65D *51/18*

U.S. Cl. 220—253 **7 Claims**



1. A secure closure of the type useful on pill containers, said closure comprising

a top closure member and a lower closure member which are mounted for vertical and rotational movement relative to one another;

apertures in each of said top and lower members which are positioned to be brought into register by rotation, and to form a pill dispensing port;

lock means to prevent relative rotation of said closure members when said members are in a first vertical relationship, one to the other, said top closure forming means to disengage said lock means on lifting of said top closure member away from said lower closure member;

stop means to prevent relative rotation of said closure members past the point at which said pill dispensing port is formed;

biasing means to hold said closure member in said first position that said apertures are maintained in non-registered position and

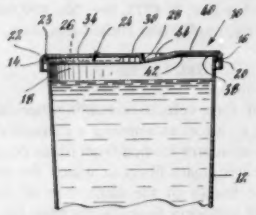
wherein said biasing means comprises a coil spring forming means to resist the lifting, and to return said top closure member to its locked position and also comprises a spring means to return said top closure member to the locked rotational position.

4,141,462

DEVICE FOR DECREASING HEAT TRANSFER AND SLOSH FROM A BEVERAGE CONTAINER

Charles D. Rucci, 315 Glen Ave., Port Chester, N.Y. 10573

Filed Nov. 7, 1977, Ser. No. 848,826
Int. Cl.[2] A47G *19/22*; B65D *7/44*, *51/16*
U.S. Cl. 220—254 8 Claims



1. A device for decreasing heat transfer from the contents of a beverage container, such as a drinking cup, glass, mug or the like, that has an open end from which the beverage may be drunk, said device comprising:

A. means for securing the device to the container and having a lip at an extreme of said device that defines a plane; and

B. a cover formed with said securing means defining a drinking opening, substantially smaller than the open end of the container, having a first crescent-sided portion of its perimeter adjacent said lip, and a second crescent-sided remainder portion of its perimeter curved away from said first portion, said drinking opening thereby having a shape and size to be received by the mouth of the beverage drinker; both said first and second portions of the perimeter of said drinking opening lying substantially in the plane defined by said lip; said cover further having

1. a web inwardly and downwardly recessed from said lip; and

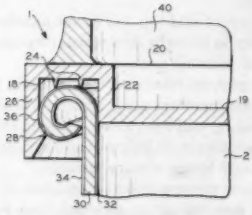
2. a transition section joining said second portion of said drinking opening perimeter and said web, sloping continuously and smoothly therebetween to smoothly guide the beverage to the drinking opening and the drinker's mouth.

4,141,463

HERMETICALLY SEALED CONTAINER

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 8, 1977, Ser. No. 858,597
Int. Cl.[2] B65D *41/00*
U.S. Cl. 220—359 13 Claims



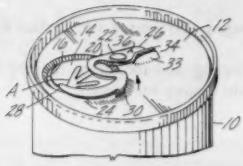
1. A hermetically sealed, recloseable container comprising (1) a container portion the upper end of which comprises an opening and a rim surrounding said opening wherein said rim has on its upper surface completely around said opening a bondable coating, (2) a closure portion comprising (a) a top panel, (b) at least one downwardly pointing thermoplastic ring projection adapted to rest upon said rim of said container portion completely around said opening, each said projection having been heated to a deformable state and the closure applied with pressure such that each said projection will form a continuous frangible bond with said bondable coating completely around the opening such that the only points of bonding between said closure and said container are in the area of contact between each said projection and said rim, and (c) a skirt depending downwardly from said top panel and surrounding the outer surface of an upper end portion of said container portion.

4,141,464

CLOSURE AND METHOD FOR EASY OPENING OF CANS

John S. Kelley, Wenham, and Albert E. Newton, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed May 23, 1978, Ser. No. 908,734
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—267 13 Claims



1. A can having an easy-open closure at least partly defined by a weakening line, and finger operable means comprising a lever secured to the can adjacent to the closure, the lever including a bendable sheet metal depressor portion movable by twisting from an inoperative position adjacent to the can to a position wherein a reduced width or pointed end of the depressor portion can be thrust against a point along said line to deflect and open the closure inwardly of the can.

4,141,465

INSULATED TANKS FOR LIQUEFIED GASES

Arne Tønnessen, Moss, Norway, assignor to Moss Rosenberg Verft a.s., Moss, Norway

Filed Jun. 7, 1977, Ser. No. 804,257
Claims priority, application Norway, Aug. 23, 1976, 762893
Int. Cl.[2] B65D *87/36*
U.S. Cl. 220—445 4 Claims

1. A tank structure for holding liquefied gas comprising, the combination of, a tank adapted to be rigidly mounted on a support structure and adapted to contain liquefied gases; and a

support structure including a generally cylindrical integral support skirt having concentric top, intermediate and bottom peripheral skirt portions, with said top skirt portion having an upper end fixed to the tank and a lower edge; said intermediate skirt portion having a top edge fixed to the lower edge of said top skirt portion and extending downwardly to a bottom edge, said bottom peripheral skirt portion having a top edge fixed to said bottom edge of said intermediate skirt portion, and insulation means surrounding said top and intermediate skirt portions to isolate said top and intermediate skirt portions from temperature effects of the surrounding atmosphere, said intermediate skirt portions having a predetermined height and a coefficient of heat conduction which is less than that coefficient of heat conduction of said top and bottom skirt portions, the coefficient of thermal expansion of said intermediate skirt portion being between the respective coefficient of thermal expansion of said top skirt portion and said bottom skirt portion, said top skirt portion being subjected to variations in temperature throughout a range from the ambient temperature to substantially the temperature of liquefied gas in the tank, and said bottom skirt portion being fixed to said support structure and subjected to the temperature of the surrounding atmosphere, with said intermediate skirt portion providing a temperature brake at all temperature differences between said top and bottom skirt portions, which may vary between a minimum value which may be zero degrees and a maximum value which is the difference between the temperature of the atmosphere surrounding the bottom skirt portion and a temperature which approaches that of the liquefied gas, whereby said skirt portions form an integral circumferential support structure irrespective of changes in the temperature of said skirt portions with the circumferential dimensions of said bottom skirt portion varying with the temperature of the surrounding atmosphere while the circumferential dimensions of said top skirt portion vary with change in tank temperature, and the circumferential dimensions of said intermediate skirt portion vary so as to maintain a coextensive relationship with said top skirt portion at its top edge and with said bottom skirt portion at its bottom edge.

4,141,466

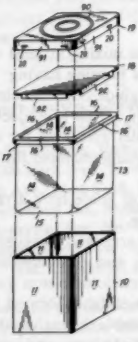
CONTAINER FOR STORING FOOD

Robert L. Gordon, Monroe; George H. Naugle, Central Valley, both of N.Y., and Keith A. Cooper, Laurel, Md., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 745,834, Nov. 29, 1976. This application Jul. 22, 1977, Ser. No. 818,245

Int. Cl.[2] B65D *5/60*; B65B *51/20*; B65D *11/02*

U.S. Cl. 220—462 **18 Claims**



1. A container comprising:

(a) an outer container constructed from paperboard and comprising four vertical walls and a bottom;

(b) a drawn and blow formed plastic inner container, said plastic inner container with one exception conforming to and abutting to the inside of said outer container, said one exception being at the four edges of the container defined by the intersection of each of said vertical walls and said bottom, said plastic inner container being spaced from said four edges about $\frac{1}{4}$ inch to about $\frac{3}{4}$ inch;

(c) four horizontal flanges extending horizontally about the periphery of the mouth of said container, said horizontal flanges extending from said plastic inner container at least about $\frac{1}{4}$ inch;

(d) four vertical flanges, said vertical flanges extending from said horizontal flanges at least about $\frac{1}{4}$ inch;

(e) a heat sealable cover, said heat sealable cover being heat sealed to substantially 100% of said horizontal flanges.

4,141,467

FLUID DRIVEN LIQUID DOSING APPARATUS

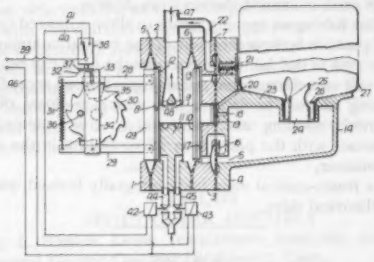
Govert J. P. Augustijn, Vlaardingen, and Jacobus H. Beun, Maassluis, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,566

Claims priority, application United Kingdom, Nov. 29, 1976, 49743/76

Int. Cl.[2] B67D *5/22*

U.S. Cl. 222—38 **6 Claims**



1. Apparatus for dosing a liquid product into a water stream which comprises:

a driving part having two hydraulic pressure chambers into which the water stream is alternately directed, a shaft, two pistons reciprocally movable respectively in the hydraulic pressure chambers and being rigidly connected by said shaft, annular membrane seals for ensuring a tight closure of the hydraulic pressure chambers and for keeping the pistons movable in these chambers, a narrow annular gap defining an outlet for each of the hydraulic pressure chambers, an outlet pipe for the water stream positioned between and commonly communicating with the two hydraulic pressure chambers through said annular gap;

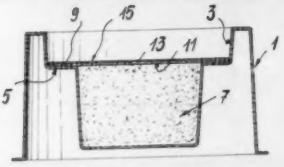
a pumping part having a pumping chamber into which one of the pistons of the driving part can be moved, a first non-return valve for unidirectionally controlling the flow of the liquid product from a reservoir into the pumping chamber, and a second non-return valve for unidirectionally controlling the flow of the liquid product from the pumping chamber into the water stream in the outlet pipe; and

means connected to the pistons for alternately directing the water stream into one of the hydraulic pressure chambers of the driving part.

4,141,468
FLEXIBLE COMPOSITE CONTAINER FOR DISPENSING MATERIALS IN PASTE FORM

Giampaolo Funaro, Florence, Italy, assignor to Primark AG, Coira, Switzerland

Continuation of Ser. No. 673,573, Apr. 5, 1976, abandoned. This application Nov. 1, 1977, Ser. No. 847,631
Claims priority, application Italy, Apr. 18, 1975, 11626 B/75; Jul. 25, 1975, 11729 B/75
Int. Cl.[2] B65D *35/08*
U.S. Cl. 222—105 4 Claims

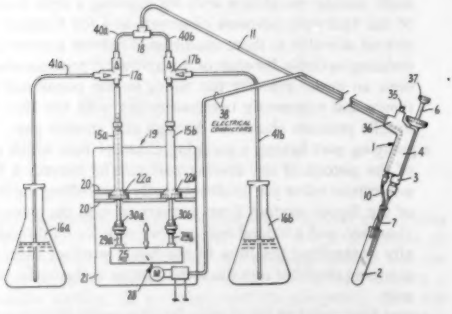


1. A composite container-dispenser for holding small quantities of coloring paste adapted to be diluted prior to use comprising in combination:
- a central paste container made from deformable material;
- a flat annular zone surrounding an opening of the central container;
- cylindrical sides contiguous with said annular zone forming a shallow cup;
- a disk having a diameter slightly smaller than the internal diameter of the cup adapted to form an air-tight seal across the opening of the central container and prevent the paste contained therein from drying;
- the disk having an opening means to allow a desired quantity of paste to be squeezed out of the central container into the area of the shallow cup so that the paste can be diluted in said cup; the material remaining in the cup area after use being adapted to form a film which re-closes the preformed opening and prevents air from coming into contact with the paste material remaining in the central container;
- and a frusto-conical main body integrally formed with said cylindrical sides.

4,141,469
MICRODISPENSING DILUTION SYSTEM

Thomas E. Lee, 3983 Canyon Rd., Lafayette, Calif. 10573

Filed May 2, 1977, Ser. No. 793,080
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—135 8 Claims

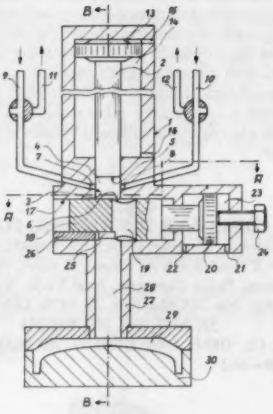


1. A system for diluting a precise quantity of fluid sample with diluent comprising
- a handle;
- a manually operable sample microdispenser carrying the sample and mounted on the handle;
- at least one diluent microdispenser remote from the handle for dispensing diluent;
- a flexible conduit communicating the diluent microdispenser to the handle for discharge of diluent adjacent to sample dispensed from the sample microdispenser;
- a power actuator for operating the diluent microdispenser;
- and control means for the power actuator to dispense diluent.

4,141,470
MIXING HEAD FOR MIXING AT LEAST TWO REACTIVE COMPONENTS

Klaus Schulte, and Heinrich Ersfeld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,088
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612812
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—137 5 Claims



5. A mixing head for mixing at least two reactive components comprising: (A) a housing having
- (i) an ejector piston guide bore therein,
- (ii) a mixing chamber within said ejector piston guide bore and into which inlet apertures for said reactive components open, said mixing chamber further defined as having an outlet opening,
- (iii) a restrictor piston guide bore arranged transversely of said outlet opening,
- (iv) an outflow bore arranged transversely of said restrictor piston guide bore, and communicating with said outlet opening via said restrictor piston guide bore;
- (B) an ejector piston slidably located in said ejector piston guide bore, and slidable through said mixing chamber, said restrictor piston guide bore, and said outflow bore;
- (C) a restrictor piston slidably located in said restrictor piston guide bore and having a passage therethrough, said passage adapted to directly connect said outlet opening and said outflow bore, and said passage being of such a cross-section that said ejector piston can pass therethrough.

4,141,471
CAP FOR ATOMIZER

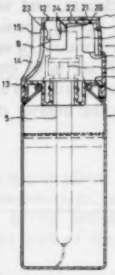
Takamitsu Nozawa; Nobuo Yamanaka, and Riichi Ogawa, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,678

Claims priority, application Japan, Apr. 6, 1976, 51-43017[U]; Apr. 8, 1976, 51-43702[U]; Apr. 16, 1976, 51-48232[U]; Apr. 16, 1976, 51-48233[U]

Int. Cl.² B67D *5/06*

U.S. Cl. 222—182 **6 Claims**



1. A cap for use with an atomizer connected to a container body and operable to spray liquid through a nozzle of the atomizer upon movement of an atomizer head, said cap comprising:

a cylindrical cap body including a top wall and a peripheral wall having a lower portion adapted to be fitted onto a container body of an atomizer; and

an operation lever provided internally of said cap body,

said cap body including an elongated atomizing window, said window extending parallel to the axis of said cap body, in a front portion of said peripheral wall,

said cap body further including an operation window in at least a rear upper portion of said peripheral wall and a portion of said top wall adjacent said rear upper portion,

said operation lever including:

one end engaging a front inner surface of said peripheral wall of said cap body;

a front lower surface adapted to engage a top surface of an atomizer head resiliently projecting from a container body;

a rear end dispsed in said operation window; and

a shielding plate sealing at least the portion of said operation window in the upper rear portion of said peripheral wall,

whereby the atomizer head is depressed as said operation lever is depressed.

4,141,472
AEROSOL CONTAINER WITH GAS-PERMEABLE MEMBRANE

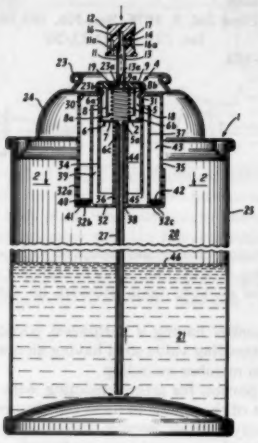
Joseph G. Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Marvin Small, 1100 Park Ave., New York, N.Y. 10805; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10003, and Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07901

Continuation-in-part of Ser. No. 706,857, Jul. 19, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 774,187

Int. Cl.² B65D *83/14*

U.S. Cl. 222—189 **45 Claims**

1. An aerosol container for use with compositions containing liquefied flammable propellants, and having a gas-permeable membrane that is at best only slowly permeable by liquefied propellants, and impeding liquid flow via a gas tap orifice through an open manually-operated delivery valve, at least when the container is tipped from the upright position beyond the horizontal towards the fully inverted position, the container comprising, in combination, a pressurizable container having at least one storage compartment for an aerosol composition and a liquefied propellant in which compartment propellant can assume an orientation according to orientation of the container between a horizontal and an upright position, and a horizontal and an inverted position; a delivery valve movable manually between open and closed positions, and including a valve stem and a delivery port; an aerosol-conveying passage in flow connection at one end with the storage compartment and at the other end with the delivery port, manipulation of the delivery valve opening and closing the passage to flow of



aerosol composition and propellant from the storage compartment to the delivery port; a gas tap orifice in flow connection on one side with the storage compartment and on the other side with the delivery port; and a gas-permeable membrane that is at best only slowly permeable by liquefied propellants, disposed across the gas tap orifice in the line of flow of liquefied propellant from the storage compartment to the delivery port, and impeding flow of liquefied propellant to the delivery port, at least in an orientation of the container between the horizontal and an inverted position.

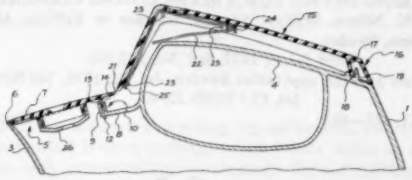
4,141,473
SPOUT COVER ASSEMBLY

Barry L. Hudson, Lower Templestowe, Australia, assignor to General Electric Company, Bridgeport, Conn.

Filed Sep. 6, 1977, Ser. No. 830,429

Int. Cl.² A47G *19/14*

U.S. Cl. 222—473 **8 Claims**



1. A manually operable spout cover assembly for the pouring spout of a container having a handle positioned above said container, said assembly comprising a cover flap shaped substantially to correspond with the opening of said spout, hinge means connecting said cover flap with said container to form a fulcrum for said cover flap to permit movement of said flap between a spout covering position and a spout pouring position; a handle lever pivotally mounted with one end on said handle, the other end of said lever being hingedly connected to one end of said cover flap, said lever and cover flap being

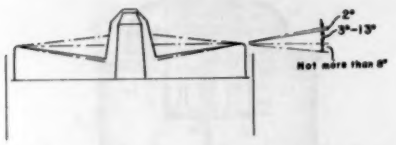
integrally formed from plastics material; and resilient means interposed between said handle and said lever to urge said other end of said lever away from said handle to move said cover flap into said spout covering position.

4,141,474

SELF-CLOSING CLOSURE UTILIZING A SINGLE DIAPHRAGM

Nils B. Nilson, Mjolby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Jul. 9, 1976, Ser. No. 703,794
Int. Cl.[2] B65D *35/50*
U.S. Cl. 222—493 **15 Claims**



1. A self-closing closure unit adapted to be connected to a package having at least one resilient wall for dispensing the contents of the package upon pressure on the resilient wall comprising:

a spider member having a peripheral portion and an outwardly extending valve stem having an outer surface; and

a diaphragm member including

a flange portion for interconnecting with the peripheral portion of the spider to form the closure unit,

a substantially tubular portion surrounding the stem and spaced therefrom, terminating at its outer end in an open lip which makes a close, sliding fit with the outer surface of the stem to form a valve with the stem; and

a relatively thin, resilient planar portion integral with and directly connected to the flange portion and the tubular portion at its inner end, the connection of the planar portion with the flange portion forming a plane and said flange portion restraining said planar portion from expanding radially,

said planar portion being formed to have a concave configuration with said plane and said lip sealing against said stem when said valve is closed, and

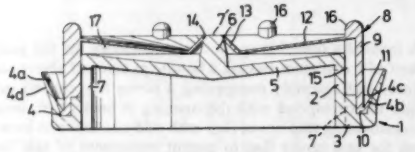
said planar portion having a flexed convex configuration when said valve is opened by pressure on the resilient wall and said planar portion is forced by said pressure through said plane, and said planar portion returning by the flexure to the concave configuration when the pressure on the resilient wall is released.

4,141,475

LOCKING DEVICE FOR A SELF-CLOSING CLOSURE

Billy N. Nilson, Mjölby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Jul. 6, 1977, Ser. No. 813,303
Claims priority, application Sweden, Jul. 12, 1976, 7607931
Int. Cl.[2] B65D *25/40*
U.S. Cl. 222—494 **3 Claims**



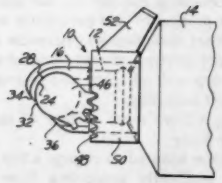
1. A locking device for a self-closing closure for a package, said device comprising a diaphragm member having a resilient diaphragm, provided with a centrally located sleeve and a central member having a wall, provided with a centrally located stem projecting from said wall and having its end provided to sealingly engage said sleeve in the closed position of the closure, wherein said diaphragm member and said central member have outer, peripheral parts thereof mutually connected in a sealing manner and in a manner enabling said diaphragm member to be angularly displaced relative to said central member, said central member having a cylindrical portion, provided with openings therein for establishing flow communication with the interior of the package, said diaphragm member having a tubular portion sealingly engaging said cylindrical portion of said central member at least in the closed position of the closure, said tubular portion of said diaphragm member also having openings which, depending upon the relative angular positions of said diaphragm member and said central member, are in or out of registry with the openings of said cylindrical portion to establish or cut off flow communication between the interior of the closure and the package.

4,141,476

VALVED CLOSURE FOR DISPENSING CONTAINER

Jakob Rech, Detroit, Mich., assignor to Sheldon H. Applefield and Jerome Applefield, both of Southfield, Mich., part interest to each

Filed Sep. 24, 1976, Ser. No. 726,418
Int. Cl.[2] B65D *25/48*
U.S. Cl. 222—505 **11 Claims**



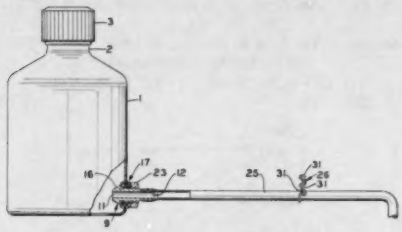
1. A closure for a dispensing container comprising a housing, means for attaching said housing to said container and for placing the interior of said housing in communication with the interior of said container, a slotted dispensing aperture formed in a wall of said housing and extending from side to side of said housing, a cylindrical valve body disposed rotatably in said housing proximate said dispensing aperture and having a peripheral surface normally obturating said dispensing aperture when said valve body and said housing are mutually rotated to a first position, said valve body having a passageway therethrough for placing the interior of said housing in communication with said dispensing aperture when said valve body and said housing are mutually rotated to a second position, said dispensing aperture having a pair of opposite side edges chamfered and each lying in a plane substantially coplanar with the plane of the other chamfered side edge, each of said chamfered side edges forming a sharp edge whereby a ribbon of pasty material dispensed from said container is sheared off upon rotation of said valve body from said second to said first position and cleaning of the edges of said aperture is greatly facilitated, and means for rotating said valve body, wherein said means for rotating said valve body comprises a toothed sector affixed to an end of said valve body and a collar rotatably disposed about said housing, said collar having a toothed edge meshing with said toothed sector.

4,141,477

CONTROLLED IRRIGATION DEVICE

Robert W. Hengesbach, 7886 Munson Rd., Mentor, Ohio 44060

Filed Sep. 29, 1977, Ser. No. 837,735
Int. Cl.[2] B65D *5/72*
U.S. Cl. 222—569 7 Claims



1. In combination

a receptacle of set synthetic plastic having a thin peripheral wall with a hole therethrough, said peripheral wall being sufficiently rigid to be self-supporting, but resilient enough so that the wall of the hole can be elastically deformed;

a resilient grommet having a central passage and having an external peripheral groove coaxial with the passage and opening outwardly radially so that the groove has a bottom wall and spaced radially extending side walls;

a discharge element having a body with an inlet at one end and an outlet at the other end, and having a passage connecting the inlet and outlet;

an external radial flange on the body between its ends and having one face facing toward the outlet end of the body;

an external screw thread on the body between the flange and the outlet end;

said grommet being disposed in said hole with the marginal portion of the peripheral wall, which surrounds and is adjacent to, the hole, disposed between said radial side walls of the groove;

said flange and hole being so related in diameter that the flange can be pushed, inlet end foremost, bodily endwise through the hole from the outside of the receptacle;

the diameter of the flange being greater than the diameter of said central passage of the grommet and said one face of the flange engaging the inner end of the grommet;

the threaded portion of the body being so related to the diameter of said central passage of the grommet that said portion can pass therethrough, and protrude from the other end of the grommet; and

a jam nut in threaded engagement with that threaded portion of the body at the exterior of the receptacle, said nut being in stressed engagement with the outer end of the grommet and cooperating with the flange to compress the grommet endwise so as to clamp the side walls of its groove into sealing relation with said adjacent marginal portion of the peripheral wall of the receptacle, and the flange into sealing relation with the inner end of the grommet; whereby the fitting can be installed entirely by manipulation from the outside of the receptacle.

4,141,478

SLIDE PLATE ASSEMBLY

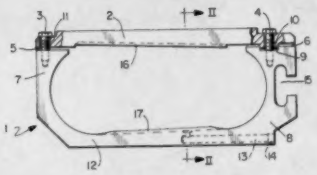
Ernst Meier, Kilchberg, Switzerland, assignor to Stopinc Aktiengesellschaft, Zug, Switzerland

Filed May 4, 1977, Ser. No. 793,858
Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620423
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—600 14 Claims

1. A slide plate assembly, particularly for use in a slide closure for closing and opening a spout plate pouring opening in a metallurgical vessel, said assembly comprising:

a slide plate having a through-flow opening therein; and

a slide plate operating frame embracing the periphery of said slide plate, said frame including a main frame member having a side and opposite ends and a removable side



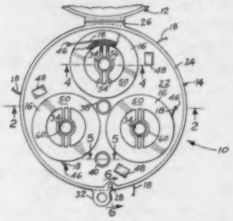
member attached to said main frame member and movable toward and away from an adjacent portion of said periphery of said slide plate, inner surfaces of said ends, said side and said side member defining therebetween a slide plate receiving opening, said inner surfaces of said side and said side member being non-parallel and diverging outwardly from a first said end to a second said end.

4,141,479

LEADER DISPENSER

Robert R. Dennison, Portland, Oreg., assignor to Weiss Scientific Glass Blowing, Inc., Portland, Oreg.

Filed Feb. 9, 1978, Ser. No. 876,471
Int. Cl.[2] B65H *35/10*
U.S. Cl. 225—38 7 Claims



6. A line dispenser comprising top and bottom, substantially symmetrical housing sections, which jointly define an enclosure, each section having a substantially flat end wall bounded by a peripheral side wall, said end walls occupying substantially parallel planes,

a plurality of spools for holding windings of line or the like, each spool having opposed end faces,

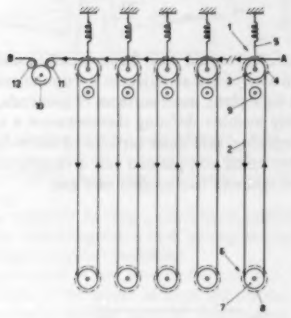
multiple spool mounting means in each housing section, each rotatably mounting a spool with the spool frictionally supported thereon, with the axis of rotation being normal to said end walls, said spools and said enclosure forming top and bottom tiers of spools with end faces of said spools in said top tier facing end faces of said spools and said bottom tiers.

4,141,480

FRICTION FILM DRIVING DEVICE FOR DEVELOPING MACHINE

Mario Calzini, Rome, Italy, assignor to O.M.A.C. Caprara S.a.s., Germignaga, Italy

Filed Jun. 21, 1977, Ser. No. 808,551
Claims priority, application Italy, Jun. 21, 1976, 50032 A/76
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—25 7 Claims



1. A friction device for film developing machines comprising:

a shaft;

a plurality of supporting roller members mounted coaxial with said shaft for supporting said film, said plurality of roller members further mounted side-by-side, each of said roller members comprising a cylindrical body having spaced apart flanges defining a cylindrical driving surface therebetween;

a driving roller member mounted adjacent said plurality of supporting roller members for communication therewith, said driving roller member comprising a plurality of cylindrical body portions alternately spaced with a plurality of reduced body portions, said plurality of cylindrical body portions positioned to communicate with the cylindrical driving surface between said flanges of each of said plurality of roller members, said plurality of cylindrical body portions further comprising an outside diameter smaller than the outside diameter of said cylindrical driving surface of the plurality of supporting roller members, said plurality of reduced body portions of said driving roller members adapted to receive at least one flange of each of said two side-by-side mounted supporting roller members;

means for bearing interposed said plurality of supporting roller members and said shaft; and

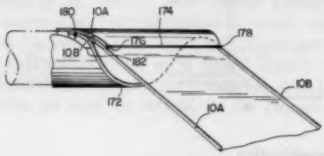
actuating means mounted in driving relationship with said driving roller member for actuating said driving roller member whereby upon a drawing action of the film the cylindrical driving surface of said plurality of supporting roller members engages said cylindrical body portions of the driving member while the adjacent flanges of the two contiguous supporting rollers are free to rotate within the reduced body portion of the driving roller member.

4,141,481

METHOD AND APPARATUS FOR MAKING HELICALLY SEAMED TUBING

Louis B. Van Petten, Union Bridge, Md., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 568,771, Apr. 23, 1975, Pat. No. 3,997,098, which is a continuation-in-part of Ser. No. 465,176, Apr. 29, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 749,751
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] B21C *37/083, 37/12;* B23K *31/06*
U.S. Cl. 228—145 29 Claims



1. A method for forming metal tubing having helical welding seams from sheet material comprising:

drawing said sheet material from a supply,

raising the two lateral edges of said sheet material to form flanges extending at an angle to the plane of said sheet material,

guiding the flanged sheet between a stationary, generally cylindrical guide sleeve having a helical forward edge and a rotatable core within said sleeve,

guiding the flange of a trailing edge of said sheet material about said helical forward edge to abut the flange of a leading edge of said sheet material, at a location on the guide sleeve and,

welding the abutted flanges adjacent said location, to form a tube with a helical welding seam,

maintaining the tube in tension adjacent said location, and maintaining the helical seam tight.

28. An apparatus for forming metal tubing having helical welding seams from sheet material comprising:

means for forming a flange on a leading and trailing edge of said sheet material,

a stationary guide sleeve having a generally cylindrical configuration,

helical tube-forming means in said guide sleeve comprising a cut-away portion having

an exposed helical edge, and

a straight edge having a front and rear end,

the said helical edge meeting the straight edge at the front end thereof,

the rear end of the straight edge being spaced slightly forward of the helical edge,

channel means in the guide sleeve starting at the rear end of the straight edge and extending rearwardly as an extension of said helical edge,

whereby said helical edge is adapted to engage the inside of the trailing edge's flange and guide it into abutment with the leading edge's flange at a location adjacent the rear end of the straight edge,

and means for welding the abutted flanges at said location.

4,141,482

LAMINATED COMPACTED PARTICLE ALUMINUM SHEET

William G. Reynolds, Richmond, Va., assignor to Reynolds Metal Company, Richmond, Va.

Filed Apr. 25, 1977, Ser. No. 790,417
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—158 2 Claims

1. A method of producing laminated compacted-particle aluminum sheets including the steps of:

providing a plurality of compacted-particle aluminum sheets and forming said plurality of sheets into a plurality of laminates;

preheating each of said laminates of compacted-particle aluminum sheets;

rolling each of said laminates in a hot rolling mill to bond said sheets together and form bonded composite laminates;

cleaning each of said composite laminates;

fastening said cleaned composite laminates together;

further preheating the thusly fastened composite laminates; and

hot rolling the thusly fastened composite laminates to heat bond them together.

4,141,483

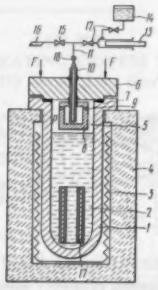
METHOD AND APPARATUS FOR FABRICATING POLYMETALLIC ARTICLES BY SOLID-STATE DIFFUSION BONDING PROCESS

Viktor J. Untilov, ulitsa Kazakova, 11; Robert G. Kheifets, ulitsa Kirova, 8, kv. 29; Jury I. Rozengart, ulitsa Fuchika, 14 kv. 11; Viktor Y. Ostrenko, Komsomlskaya ulitsa, 65, kv. 44; Efim A. Reznikov, ulitsa Simferopolskaya, 19, kv. 10; Izrail M. Sukonnik, ulitsa Volnaya, 7, kv. 22.; Jury V. Chichkov, prospekt Geroev, 65, korpus 3, kv. 56; Vladimir I. Oleinik, ulitsa Mayakovskogo, 36; Oleg P. Drobich, Krasny Kamen, 24, kv. 116; Oleg G. Fedorov, prospekt Ilicha, 21a, kv. 15, and Vadim N. Morozenko, prospekt Vorontsova, 77, kv. 299, all of, Dnepropetrovsk, U.S.S.R.

Filed Jul. 7, 1977, Ser. No. 813,672

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—193 **10 Claims**



1. A method for fabricating polymetallic articles by a diffusion bonding process in a high-temperature melt, comprising the steps of: joining the parts of an assembly to be bonded with surfaces of the parts interfitting; holding said parts of the assembly in intimate contact; placing a high-temperature melt in a container immersing said assembly of parts in said high-temperature melt; heating said container so that said high-temperature melt is heated and said assembly is heated by said high-temperature melt; and clamping said assembly of parts in said high-temperature melt by applying water vapour pressure to said melt to thereby allow diffusion bonding thereof, the temperature of said container being sufficiently high to prevent condensation of said water vapour pressure on portions of said container.

4,141,484

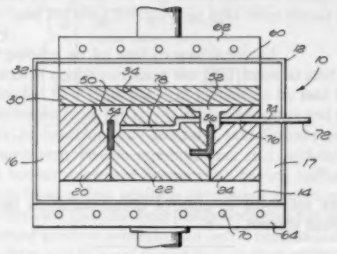
METHOD OF MAKING A METALLIC STRUCTURE BY COMBINED FLOW FORMING AND BONDING

C. Howard Hamilton, Thousand Oaks, and Leonard A. Ascani, Palos Verdes Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1976, Ser. No. 708,530

Int. Cl.[2] B23K *19/00*; B21C *23/22*

U.S. Cl. 228—265 **9 Claims**



1. A method of making a metallic structure in a single operation by combined flow-forming and bonding comprising the steps of:

providing a metal preform having flow-forming characteristics;

providing first and second shaping members, the first shaping member having a groove therein;

providing a metal workpiece to be joined to the preform, the workpiece being positioned in the groove;

positioning the preform between the shaping members such that the preform overlies the first shaping member and the groove and separates the shaping members;

heating the preform the within a temperature range suitable for flow-forming of the preform;

applying compressive pressure through the shaping members to the preform sufficient to cause the preform to flow-form against the shaping members such that the preform deforms into the groove and against the workpiece; and

diffusion bonding the preform to the workpiece by maintaining the preform and the workpiece under coordinated temperature-pressure-time duration conditions.

4,141,485

SLIDE TOP CARTON

Herbert L. Lambert, Manchester, Mo., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 12, 1978, Ser. No. 868,867

Int. Cl.[2] B67D *3/00*; B65D *5/72*

U.S. Cl. 229—17 SC **8 Claims**

1. A slide top carton comprising:

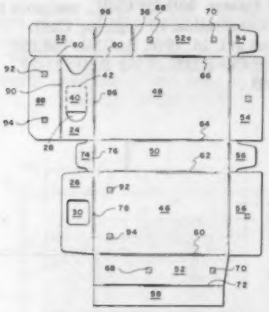
a sidewall structure including first, second and third relatively narrow, generally rectangular panels alternating with first and second relatively wider, generally rectangular panels;

a generally rectangular inner member extending from and substantially as wide as one of said wider panels, said inner member having an orifice therethrough;

a generally rectangular outer member extending from and substantially as wide as the other of said wider panels, said outer member being positioned in overlapping relation to said inner member and having an orifice area aligned with the orifice of said inner member, the orifice area of said outer member initially being sealed by a removable sealing means; and

a sliding member forming an extension of one of said narrow panels, said sliding member being substantially as wide as

the panel from which it extends and including a portion slidably positioned between said overlapping inner and



outer members to control communication between the orifices therein.

4,141,486

COLLAPSIBLE SIDE WALLS FOR A PACKING CASE

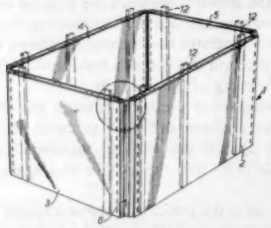
Tor N. Nilsen, Østrevei 25, 3150 Tolvsrød, Norway

Filed Oct. 12, 1977, Ser. No. 841,444

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 7710703[U]

Int. Cl.[2] B65D *9/32*

U.S. Cl. 229—23 C **3 Claims**



1. Collapsible side walls for a packing case, consisting of four wall sections which are hinged together at the side edges, characterized in that each wall section **2, 3, 4, 5** consists of two facing rigid fiberboard plates **8, 9**, the facing flat sides of each section being held mutually spaced by means of parallel, mutually spaced vertical ribs **10, 10', 10''**, and in that the hinge at the side edges of each wall section is formed from a strip of pliable material whose longitudinal edges are secured in the slot **11** between the plates **8, 9** of the wall sections **2, 3, 4, 5**.

4,141,487

DISPOSABLE FOOD PACKAGE

Clifford C. Faust, Riverside, and Mark F. Mettler, Lombard, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,324

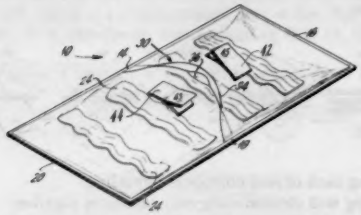
Int. Cl.[2] B65D *65/10, 65/38*

U.S. Cl. 229—43 **12 Claims**

1. A disposable package for enclosing a food product adapted to be cooked within the package at an elevated temperature without being immersed in a surrounding liquid medium comprising:

a continuous unitary layer of plastic film forming the upper wall surface of said package adapted to overlie said food product, said layer being folded over to form at least one pleated section having a cross-sectional geometry resembling the letter "Z" or mirror image thereof and having an interior fold line extending between two opposite substantially parallel sides intermediate the ends thereof;

at least one elongated opening passing through said layer and disposed along the interior fold line of said pleated section for venting gas during cooking, and an adhesive



sealant material having a predetermined melting temperature below said cooking temperature, said adhesive sealant material being disposed within said pleated section for sealing said elongated opening until said predetermined temperature is reached.

4,141,488

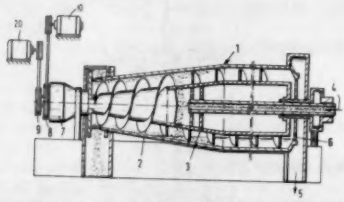
CENTRIFUGE

Johannes P. Gense, Meerssen, Netherlands, assignor to Koninklijke Nederlandse Papierfabrieken N.W., Maastricht, Netherlands

Filed Aug. 18, 1977, Ser. No. 825,761

Int. Cl.[2] B04B *1/20, 9/10*

U.S. Cl. 233—7 **3 Claims**



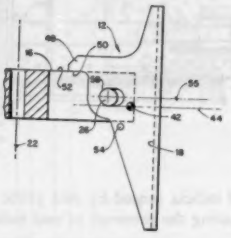
1. A centrifuge for separating liquid and solid materials, comprising: an elongated, rotatably mounted outer drum; an inner drum with a helical conveyor means thereon mounted in said outer drum for rotation about an axis coincident with the axis of rotation of said outer drum; means for rotating said outer drum; a differential drive so connecting said outer drum and said helical conveyor supporting inner drum that rotation of said outer drum effects rotation of said inner drum at a speed different from the speed of rotation of said outer drum; and means for keeping the differential between the speed of the outer drum and the speed of the inner drum substantially constant, said last mentioned means comprising an electrical generator drive connected in braking relationship to said inner drum and control means for so proportioning the braking effect exerted by said generator to variations in the differential between the speed of the outer drum and the speed of the inner drum as to keep said speed differential substantially constant.

4,141,489

SWINGING CARRIER CENTRIFUGE ROTOR

Herschel E. Wright, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 2, 1977, Ser. No. 847,879
Int. Cl.[2] B04B 5/02
U.S. Cl. 233—26 2 Claims



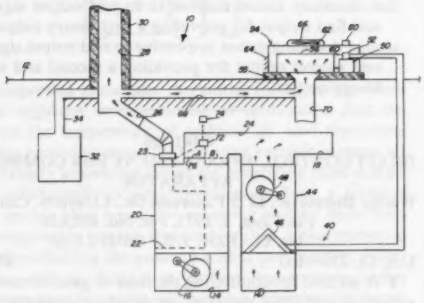
1. A swinging carrier rotor comprising:
a rotor frame having a plurality of radially extending arms forming at least two yoke portions;
at least two carriers for holding a plurality of specimen containers, said carriers having a support base;
means for pivotally mounting each of said carriers within said yoke portions of said rotor frame in such a manner that the pivot axis of each of said carriers is asymmetrical with the geometric central plane of the carrier so that, when said rotor frame is rotating at operational speed, the pivot plane of said carrier is above the central plane of said carrier to insure that said support base of each of said carriers will always assume an orientation parallel to the spin axis of said rotor to overcome friction forces between said carrier and said mounting means as said carrier moves relative to said rotor frame; and
a projection extending from the top of each of said carriers, said projection contacting one of said radially extending arms of said rotor frame when said rotor is at operational speed to prevent said asymmetrical pivot axis of each of said carriers in conjunction with the centrifugal forces from moving each of said support bases beyond said parallel relation with said spin axis.

4,141,490

HEATING SYSTEM

Antonino Franchina, 5219 Botsford St., Sterling Heights, Mich. 48077

Filed Jan. 23, 1978, Ser. No. 871,493
Int. Cl.[2] G05D 23/00
U.S. Cl. 237—2 B 4 Claims



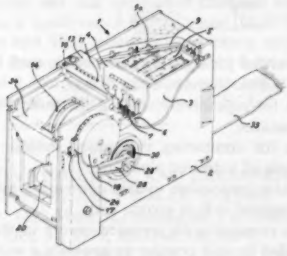
1. A heating system for a building comprising:
a hot-air duct;
a cold-air return;
a gas furnace having an inlet communicating with said cold-air return and an outlet communicating with said hot-air duct, said furnace having a combustion chamber for heating the air passing thereby from said cold-air return to said hot-air duct;
an exhaust stack for exhausting the hot gases from said combustion chamber;
a heat pump comprising a condenser with an inlet communicating with said cold-air return and an outlet communicating with said hot-air duct, said condenser heating the air passing thereby from said cold-air return to said hot-air duct, said heat pump having an evaporator located externally of said building for drawing heat from the air passing thereby;
a fan for passing air by said evaporator; and
conduit means communicating the heat stack to said evaporator so that heat from the heat exhausted by said furnace may be drawn from the air via said evaporator and utilized to provide heat for said building, said furnace and said heat pump respectively communicate said cold-air return to said hot-air duct, said hot-air duct having baffle means movable from a first position permitting communication of said furnace and said heat pump with said hot-air duct, to a second position wherein said baffle permits communication from said furnace to said hot-air duct while permitting communication of air through said heat pump to said hot-air duct.

4,141,491

TAPE PUNCHING DEVICE

Jørn Thellúfsen, Soborg, and Niels E. M. Nielsen, Roskilde, both of Denmark, assignors to GNT Automatic A/S, Denmark

Filed Dec. 6, 1977, Ser. No. 858,424
Claims priority, application Denmark, Oct. 3, 1977, 4368/77
Int. Cl.[2] G06K 1/10
U.S. Cl. 234—115 19 Claims



1. A tape punching device comprising a travel passage for a tape to be provided with signal holes, a punching tool having a row of needle guides across the travel passage corresponding to the maximum number of holes to be punched across the tape, a punching needle in each needle guide, a rocking arm mounted for rocking movement about a stationary axis at a distance from the row of punching needles, means for continuously causing said rocking arm to rock forth and back to perform alternate operative and return strokes, said rocking arm extending from said stationary axis to the vicinity of the rear ends of the punching needles, a number of selector strips corresponding to the number of punching needles being slidably mounted in the rocking arm, each selector strip having a free rear end adjacent the rocking axis of the rocking arm and a free front end adjacent the rear end of a corresponding one of the punching needles, a stationary selector magnet having an armature with a free end adapted to act on the free rear end of each selector strip to displace same from a retracted position in which its front end is retracted from a supporting edge formed adjacent the front end of the rocking arm and is not engageable with the rear end of the corresponding punching needle, to an advanced position in which its front end extends freely beyond

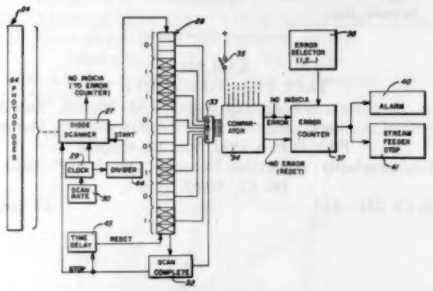
said supporting edge behind the rear end of the corresponding punching needle and is engageable therewith by the operative stroke of the rocking arm to advance the respective punching needle to punch a hole in the tape, restoring spring means for restoring any selector strip to its retracted position when no longer acted upon by the armature of the respective selector magnet, means on said rocking arm engageable during the return stroke thereof with shoulder faces of any and all punching needles that have been advanced during the preceding operative stroke, tape feeding means, and electronic means for producing signals suitable for controlling the admission of punching data to said selector magnets and the transmission of feeding pulses to said tape feeding means.

4,141,492

SIGNATURE VERIFIER WITH INDICIA SENSOR

Walter A. Michel, Highland Park, and Donald E. Hagenbart, Oak Forest, both of Ill., assignors to R. R. Donnelley & Sons, Inc., Chicago, Ill.

Filed Oct. 3, 1977, Ser. No. 838,651
Int. Cl.[2] G06K *7/14, 13/08;* **B65H** *5/22*
U.S. Cl. 235—437 **19 Claims**



1. A verifier for signatures of a book, each signature having a coded indicia thereon, comprising:

means for repetitively sensing the indicia on one or more signatures;

means for comparing the sensed indicia with the coded indicia of a desired signature;

a counter responsive to said comparing means for totaling the sensed indicia errors; and

means responsive to repeated errors in the sensed indicia totaled by said counter to generate a warning signal.

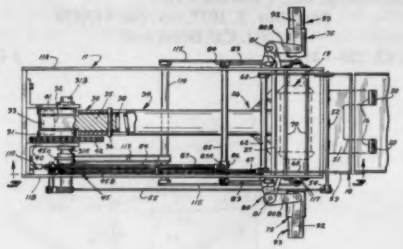
4,141,493

CONTAINER AND APPARATUS HAVING A SENSOR FOR RETURN DEPOSIT PAYOUT OF SUCH CONTAINER

Ewald A. Arp, 15910 Cedar Ridge Rd., Hopkins, Minn. 55343

Continuation-in-part of Ser. No. 742,662, Nov. 17, 1976, abandoned. This application Jul. 13, 1977, Ser. No. 815,238
Int. Cl.[2] G06K *7/04;* **B67B** *3/26;* **B07C** *5/342*
U.S. Cl. 235—448 **29 Claims**

1. In a container handling apparatus having means for providing for identifying a generally cylindrical container having a longitudinal central axis, and havng means for receiving and supporting each of the individual containers, the improvement comprising means for identifying containers as to a particular configuration or indicia, including first means operable to engage wall portions of a container on the means for receiving and supporting upon movement of the first means toward such container and to position the central axis of such container in known relation with respect to portions of said first means, probe means actuable in direction of the longitudinal axis of such container subsequent to the positioning of a container by the first means for identification of particular indicia on at least one of the ends of said container, and means responsive to the



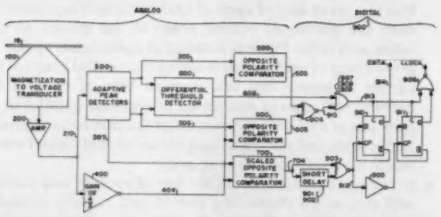
presence of indicia sensed by said probe means to provide a signal indicating the presence of said indicia.

4,141,494

DIGITAL CODE READER

Alan J. Fisher, 5711 Tannahill Cir., Huntsville, Ala. 35802

Filed Feb. 25, 1977, Ser. No. 772,081
Int. Cl.[2] G06K *7/08, 19/06;* **G11B** *5/09, 17/02*
U.S. Cl. 235—449 **23 Claims**



1. A digital translation system comprising:

a medium on which is recorded a series of length encoded, abrupt changes in a physical state which vary in length between a selected minimum spacing and a selected maximum spacing, and wherein at least two spacings occur;

transducer means for providing from said medium a detected output signal containing at least a first output signal approximating a sinusoid of a first amplitude responsive to the occurrence of changes of a first spacing, and a second output signal approximating a sinusoid of a second amplitude responsive to changes having a second and reduced spacing compared with said changes of a first spacing;

first decoding means responsive to said output signal, and said first output for providing a first binary output; and

second decoding means responsive to said output signal, and said second output for providing a second and alternate binary output.

4,141,495

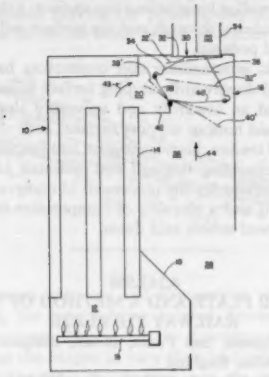
DRAFT CONTROL ARRANGEMENT FOR COMBUSTION APPARATUS

Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549

Filed Jun. 2, 1977, Ser. No. 802,678
Int. Cl.[2] F23L *3/00;* **G05D** *23/08*
U.S. Cl. 236—1 G **15 Claims**

1. A method for controlling the flow of gases in combustion apparatus including the steps of directing combustion gases along a first flow path from the apparatus toward a vent, positioning a draft control member in the vent for controlling gas flow in one path from the combustion apparatus and in another path through a draft hood from the surrounding atmosphere, sensing the temperature of gases within the draft hood,

and moving the vent control means to and from said vent responsive to the temperature of the gases sensed within the



draft hood to minimize the amount of dilution air which flows from the atmosphere through the draft hood.

4,141,496

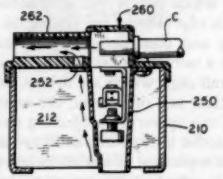
PNEUMATIC THERMOSTAT

Ernest J. Duchek, Mt. Prospect, Ill., assignor to Powers Regulator Co., Skokie, Ill.

Division of Ser. No. 566,387, Apr. 9, 1975, Pat. No. 4,007,873, which is a continuation-in-part of Ser. No. 472,337, May 22, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,679

Int. Cl.[2] F24F *11/02*

U.S. Cl. 236—49 **14 Claims**



1. An improved pneumatic thermostat for adjusting a volume flow regulator in conditioned air distribution duct depending on the temperature of ambient air, said thermostat comprising: receiving means for receiving variable pressure air supply; pressure generating means for generating from said air supply a substantially constant-pressure air flow; a pressure chamber having inlet means for receiving said air flow; temperature-responsive means disposed within a thermometric chamber for adjusting the pressure within said pressure chamber in response to changes in ambient temperature; outlet means communicating with said pressure chamber for transmitting a pressure signal, said pressure signal being indicative of said temperature; primary aspirating means for drawing ambient air through the interior of said thermometric chamber; and, secondary aspirating means for drawing ambient air through the space immediately adjacent the exterior of said thermometric chamber so as to maintain the walls of said thermometric chamber at subtantially ambient temperature.

4,141,497

SENSING AND SETTING DEVICE FOR A REGULATOR ARRANGEMENT COMPRISING A PLURALITY OF THERMOSTATICALLY ACTUATED VALVES

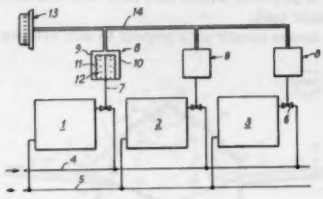
Knud V. Valbjorn, Nordborg, and Niels P. G. Graversen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 6, 1977, Ser. No. 794,473

Claims priority, application Fed. Rep. of Germany, May 10, 1976, 2620640

Int. Cl.[2] G05D *23/12*

U.S. Cl. 236—51 **7 Claims**



1. A thermostatic valve regulating system, comprising at least two valve operating units each having an expansible chamber element, said valve operating units each having valve operating rod means movably responsive in opening and closing directions to the expansion and recession of said expansible chamber elements, a thermostatic regulator having a casing, said regulator having a transmitting expansible chamber element (TECE) and a temperature responsive expansible chamber element (TRECE), first and second expansible capillary tube means between said TECE and each of said operating unit expansible chamber elements, a transmitting liquid in said capillary tube means and said expansible chamber elements connected thereto, a liquid-vapor filling in said TRECE, said TECE having one end fixed relative to said casing and a free end, said TRECE having one end in adjustably fixed relation to said casing and a free end in common with and in series transmitting relation to said free end of said TECE.

4,141,498

COMBINATION STRUCTURE AND GREENHOUSE UTILIZING INDIRECT SOLAR ENERGY

Walter Marschner, 1292 Main St., Slatington, Pa. 18080

Filed Oct. 31, 1977, Ser. No. 846,700

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A **10 Claims**

1. A multi-story combined building structure comprising:

(a) a first exterior building unit including exterior walls, roof and at least two floors adapted for human habitation, and

(b) a second interior single floor building unit including above a ground floor, walls and top constructed substantially of heat and light admitting material, said walls defining interior walls of said first building unit, and said top comprising

(i) a first lower roof whose dimensions are generally concave toward its center and

(ii) a second upper roof, said second upper roof including generally vertical sides and a multiplanar generally convex top which extends in height above said roof of said first unit, said roofs defining the top and bottom of an upper greenhouse chamber;

(c) a water storage tank;

(d) a heat sink including heat conducting elements disposed beneath the ground contiguous with the building structure;

(e) a continuous water conducting pipe extending vertically along the walls of said second interior building unit and horizontally around said interior building unit at each story of said multi-story structure;

(f) heat radiating means interspersing said horizontally dis-

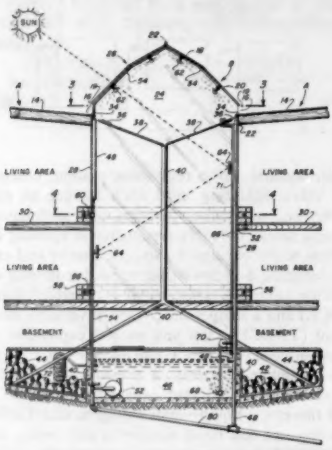
posed water conducting pipe and connected thereto by valve by-pass means, said water conducting pipe being connected in a closed loop circuit to said water storage tank;

(g) a pump adapted to communicate with water in said water storage tank whereby water in said tank may be pumped upwardly through said water conducting pipe;

(h) water spraying means, disposed near the top of said second interior building unit;

(i) water receiving pipe means disposed through said interior building unit, one end of which is adapted to receive water from the concave lower roof top, and the other end of which is disposed within said heat sink and connected to said water tank;

(j) valve means situate with respect to said exterior roof top



and said water receiving pipe means to allow a measured amount of rain water to be received from said exterior roof through said valve means into said interior concave roof, said received water flowing by gravity into said receiving pipe means downwardly through said heat sink and into said water storage tank;

(k) water circulating means operatively connected between said water storage tank and said heat sink whereby heat value from said sink may be transferred to said water;

(l) an overflow receiving pipe means operatively connected with said exterior roof at its one end and connected to sewage disposal means at its other end whereby excess rain water may be conducted away from said inner concave roof top; and,

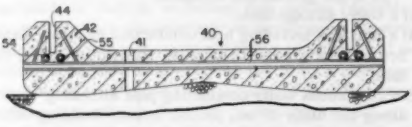
(m) overflow means operatively connected to said water storage tank to receive excess water accumulating therein.

4,141,499

CONCRETE RAILROAD BED

James L. Ramer, Rte. 1, Box 155, Sullivan, Mo. 63080

Filed May 10, 1977, Ser. No. 795,480
Int. Cl.[2] E01B *3/34, 3/38*
U.S. Cl. 238—25 **2 Claims**



1. A concrete rail bed for supporting a pair of rails comprising:

a pair of longitudinally extending concrete rail-supporting pedestals joined by a concrete connecting portion,

each said pedestal comprising a bottom support surface, an outer side wall, a longitudinal top surface, a slot extending into said pedestal through said top surface and terminating within said pedestal,

said pedestals intermediate said connectors having an inwardly and downwardly sloping surface adjacent said top surface and an inwardly and upwardly sloping surface adjacent said bottom support surface, and

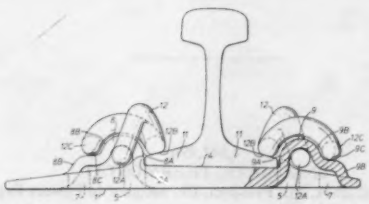
a plurality of tendon ducts transverse and longitudinal of the rails and extending through said pedestals and said connecting portions for the placement of compression-inducing tendons and a plurality of compression-inducing tendons disposed within said ducts.

4,141,500

RAILWAY TIE PLATE AND A METHOD OF MAKING A RAILWAY TIE PLATE

Nelson A. Gragnani, Sao Paulo, Brazil, assignor to Pandrol Limited, London, England

Filed Jun. 9, 1977, Ser. No. 805,163
Int. Cl.[2] E01B *9/40, 9/48;* **B21D** *28/02;* **B23P** *7/00*
U.S. Cl. 238—304 **10 Claims**



1. A railway tie plate comprising at least one upwardly-projecting straight rib, for locating the flange at the bottom of a railway rail, and two arched retaining portions on opposite sides of the tie plate under which parts of rail clips can be driven substantially parallel to the rib.

6. A method of making a railway tie plate suitable for use with rail clips which are driven substantially parallel to the longitudinal axis of a railway rail resting on the tie plate, comprising heating and then deforming an existing railway tie plate, to which a railway rail is conventionally held by means other than by rail clips which are driven substantially parallel to the longitudinal axis of the rail, the existing tie plate comprising at least one upwardly-projecting straight rib for locating the flange at the bottom of a railway rail, the deformation being such that a portion of the rib is left substantially undeformed and two arched retaining portions are formed on opposite sides of the tie plate which parts of rail clips can be driven substantially parallel to the rib.

4,141,501

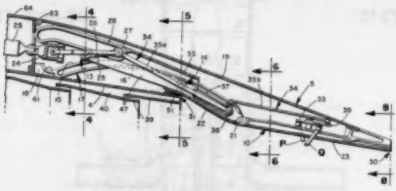
NOZZLES FOR GAS TURBINE ENGINES

Douglas J. Nightingale, Thornbury, England, assignor to Rolls-Royce (1971) Limited, London, England

Continuation-in-part of Ser. No. 676,411, Apr. 13, 1976, Pat. No. 4,049,199. This application Mar. 14, 1977, Ser. No. 777,347
Claims priority, application United Kingdom, Mar. 17, 1976, 10640/76; Aug. 4, 1976, 32404/76; May 9, 1975, 18889/75
Int. Cl.[2] B64C *15/02*
U.S. Cl. 239—265.39 **11 Claims**

1. A variable area nozzle for a gas turbine engine comprising a circumferential array of nozzle petals, including certain master petals, arranged about the discharge opening of a jet pipe, there being in respect of each said master petal an upstream roller and a downstream roller, the rollers being axially spaced apart and engaging respective radially outwardly fac-

ing and radially inwardly facing guide track surfaces fixed relative to the jet pipe and arranged for changing the inclinations of the petals relative to the jet pipe on operation of means for simultaneously moving the petals axially along the guide track surfaces the nozzle being further characterised by hinges



disposed between upstream and downstream portions of the nozzle petals, the hinges being located downstream of the rollers and by means for pivoting the downstream nozzle petal portions about the hinges to vary their inclination to the upstream nozzle portions thereby to vary the divergent flare angle of the nozzle.

4,141,502

PULSATING WATER JET MASSAGE SHOWER HEAD CONSTRUCTION

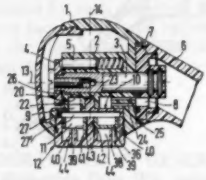
Klaus Grohe, Schiltach, Schw., Fed. Rep. of Germany, assignor to Hans Grohe KG., Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,011

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606321

Int. Cl.[2] B05B *1/08*

U.S. Cl. 239—381 **18 Claims**



1. A massage shower head comprising a housing having a water chamber therein, a mechanism in said water chamber for producing pulsating water jets including a nozzle plate enclosing said water chamber, a valve rotor which is mounted in said water chamber for free rotation and axial play directly above said nozzle plate, said nozzle plate having a bottom with an interior surface, a plurality of nozzle bore portions extending inwardly toward said valve rotor from said interior surface of said nozzle plate bottom each having at least one jet forming nozzle bore therethrough and through said bottom, said valve rotor being provided with at least one radial wall element as well as with a segmental closing disk portion, water conveying channel means connected into said water chamber directed so as to produce a rotary water motion in said water chamber in the space accommodating said rotor, said water chamber having a pressure cavity between the plane of rotation of said closing disk portion of said valve rotor and said nozzle plate which is open toward said nozzle plate, said jet forming nozzle bore projecting into approximately the plane of rotation of said closing disk, whereby a water cushion is formed between said rotor and said nozzle bore portions by water flowing into said pressure cavity.

4,141,503

NOZZLE ASSEMBLY WITH ADJUSTABLE ORIFICE

Louis Beck, c/o Beck Chemicals, 3350 W. 137th St., Cleveland, Ohio 44111

Continuation-in-part of Ser. No. 705,513, Jul. 15, 1976, Pat. No. 4,033,512, which is a division of Ser. No. 610,656, Sep. 5, 1975, Pat. No. 3,986,673. This application Jun. 14, 1977, Ser. No. 806,548

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.[2] B05B *7/00*

U.S. Cl. 239—394 **19 Claims**

1. In a nozzle assembly, a stem and a cap, said stem having a conical surface, a first and a second liquid flow passage extending through said stem and terminating at said conical surface, said cap having a matching conical surface seated on said conical surface of said stem, a first groove in said conical surface of said cap aligned with said first passage, and a second groove in said conical surface of said cap aligned with said second passage.

4,141,504

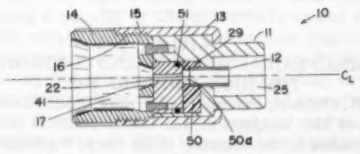
CENTRAL FLOW NOZZLE SELECTOR

Arthur A. Anderson, St. Paul, Minn., assignor to Specialty Manufacturing Company, St. Paul, Minn.

Filed Jun. 15, 1977, Ser. No. 806,760

Int. Cl.[2] B05B *1/16*

U.S. Cl. 239—394 **5 Claims**



1. An indexable sprayer for selecting of a fluid flow condition comprising:

a main body adaptable for connection to a source of high pressure fluid, said main body having first means for engaging a second member;

a second member having an opening therein for the flow of fluid therethrough;

a rotatable insert located in said body and between the source of high pressure fluid and the opening in said second member, said rotatable insert having at least one fluid nozzle located therein, second means located on said insert for engaging said second member, said second member including means for slidable engaging said first means and said second means, and said body for rotating said rotatable insert with respect to said body to allow an

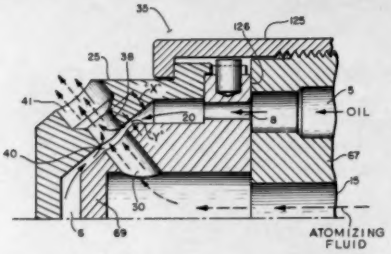
operator to position the fluid nozzle in respect to the opening in said member.

4,141,505

HEAVY FUEL OIL NOZZLE

Richard B. Reich, 703 Garden Cir., Unit 6, Streamwood, Ill. 60103

Filed Jun. 7, 1976, Ser. No. 693,138
Int. Cl.[2] B05B *7/04*; F23D *11/12*
U.S. Cl. 239—431 **11 Claims**



1. In a device for atomizing oil;
an inner member having a plurality of passages for atomizing fluid, each passage having first and second ends;
an outer member having a plurality of passages, each having first and second ends;
a sharp edged orifice adjacent to said second end of said outer member,
an exit orifice abutting said sharp edged orifice;
an expansion section adjacent the first end of said outer member;
means mounting said inner and outer members and said passages in spaced relationship defining an oil circulation cavity therebetween;
said cavity communicating with the second end of said outer passage and first end of said inner passage;
means supplying pressurized non atomized oil to said circulating cavity;
means supplying pressurized atomizing fluid to said inner member, at a pressure less than said oil, wherein oil flowing in said circulating cavity is atomized by fluid flowing in said inner passages, at said sharp edged orifice, thereby expelling fluid entrained atomized oil from said exit orifice and through said expansion section.

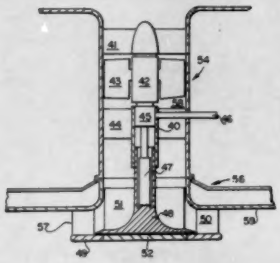
4,141,506

COMBINED RADIAL DIFFUSER AND CONTROL VALVE FOR HIGH-PRESSURE FANS

Jerry W. Cuthbert, Potomac, and Sydney Davis, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 15, 1977, Ser. No. 816,054
Int. Cl.[2] B05B *1/32*; B60V *1/14*
U.S. Cl. 239—456 **5 Claims**

1. A diffuser for converting the energy of a fluid moving in a flow channel from kinetic energy of motion into potential energy of pressure, comprising:
a flow splitter for diverting the flow radially outward from said channel;
a back plate extending radially out from said flow splitter for confining the fluid as it flows outward;
means coextensive with said back plate so a diffuser channel of outwardly increasing flow area is formed between said coextensive means and back plate for confining said fluid as it flows outward and for slowing down said fluid in an orderly and efficient manner;
means for adjusting the position of said flow splitter in relation to said flow channel and coextensive means so as to vary the flow area of said diffuser channel whereby said diffuser can accomodate different flow rates; and
said adjusting means operates only to adjust the position of the flow splitter while the back plate is held fixed relative



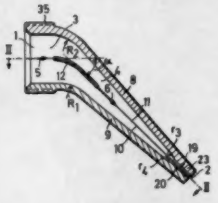
to said flow channel whereby said flow splitter can act as a valve completely blocking flow through said flow channel when said flow splitter is positioned abutting said coextensive means in said flow channel.

4,141,507

LIQUID DISCHARGE NOZZLE WITH FLOW DIVIDER

Martin Rump, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Dietz Armaturen GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,741
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619415
Int. Cl.[2] B05B *1/04*
U.S. Cl. 239—590.5 **14 Claims**



1. In a nozzle for forming a liquid jet, including a flow passage having a circular inlet and a flat rectangular outlet; the cross section of the flow passage gradually changing from a circular shape to a flat rectangular shape; the magnitude of the cross-sectional area of the flow passage gradually decreasing in the flow direction of the liquid; the flow passage changing direction in a zone at the upstream beginning of the change of cross-sectional shape to assume a new direction being at an acute angle of deflection to an original direction of the flow passage; the long sides of the rectangular cross section of the flow passage being perpendicular to a first imaginary plane containing both legs of the angle of deflection; wherein the nozzle has a first and a second nozzle part having, respectively, first and second edge faces; the nozzle parts being joined to one another by a face-to-face engagement between said first and second edge faces; said edge faces extending throughout the entire length of the nozzle and being perpendicular to said first imaginary plane; said edge faces lying in a second imaginary plane halving said flow passage along the entire length of the nozzle; the improvement comprising a flow divider supported in said flow passage and extending in said zone and wherein said flow divider changes direction for following the course of directional change of said flow passage and wherein said flow divider is clamped between said first and second nozzle parts.

4,141,508

SPREADER

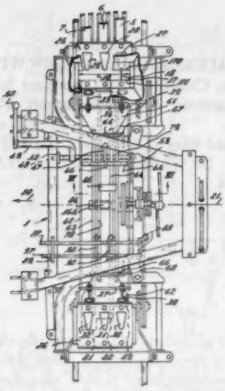
Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Jan. 17, 1977, Ser. No. 759,671

Claims priority, application Netherlands, Jan. 16, 1976, 7600408

Int. Cl.[2] A01C *3/06*

U.S. Cl. 239—664 27 Claims



1. A spreader comprising a frame, a hopper and a plurality of parallel conveyors extending away from said hopper, each said conveyor being, in a region thereof adjacent said hopper, disposed to receive material for spreading from delivery means provided in said hopper, said delivery means comprising a delivery port and being provided with a dosing member, a plurality of dosing apertures and a closing plate included in said dosing member whereby there is at least one corresponding aperture for each said conveyor, said closing plate being movable as a whole relative to said apertures and having separate closing plate portions for each conveyor adapted to close or open said apertures successively one by one by means of which closing plate the flow of said material through said delivery port and said dosing apertures is selectively successively obstructed or provided.

4,141,509

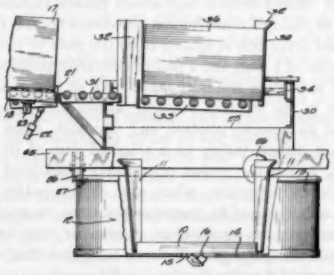
BALE LOADER FOR FLUFF GENERATOR

Edmund A. Radzins, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 6, 1978, Ser. No. 867,734

Int. Cl.[2] B02C *9/00, 13/286*

U.S. Cl. 241—30 15 Claims



1. A method of loading a fresh bale of stacked sheets of wood pulp into a continuously rotating bale milling cradle and comprising the steps of positioning a bale loading cradle adjacent the bale milling cradle, holding the bale loading cradle stationary while the bale milling cradle continues to rotate, loading the fresh bale into the stationary bale loading cradle, freeing the bale loading cradle for rotation, rotating the bale loading cradle in synchronism with the bale milling cradle and in alignment therewith, transferring the bale from the bale loading cradle into the bale milling cradle while both cradles rotate in synchronism, and after transfer has been completed stopping rotation of the bale loading cradle to ready it to accept another fresh bale.

4,141,510

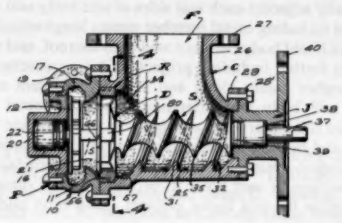
MATERIAL REDUCTION MEANS FOR PUMPS

Arthur Smith, 1845 Randolph St., Los Angeles, Calif. 90001

Filed Jun. 15, 1977, Ser. No. 806,724

Int. Cl.[2] B02C *23/36*

U.S. Cl. 241—46 A 6 Claims



1. A pump including an elongate housing structure with front and rear ends defining a radially extending volute chamber within its front end portion, a central inlet opening communicating with the front end of the chamber and an outlet passage substantially tangential with and communicating with the chamber, a rotor with substantially radially extending vanes positioned in the chamber and support means carried by the housing structure and rotatably supporting the rotor; a milling chamber defined by the housing structure forward of the volute chamber and adjacent said inlet opening; an elongate milling ring with circumferentially spaced radially inwardly and axially opening material conducting grooves defining elongate axially extending circumferentially spaced milling teeth; an elongate milling disc positioned within the rings, coupling means drivingly coupling the disc with the rotor, said disc carrying a plurality of circumferentially spaced milling blocks with radially extending circumferentially disposed material engaging side surfaces and radially outwardly disposed ends opposing said grooves and teeth; said housing structure defining an elongate bore concentric with and extending forwardly from the milling chamber and a material receiving duct communicating with the bore to conduct material into the bore; an elongate screw with front and rear ends positioned within the bore, coupling means drivingly coupling the rear end of the screw with the disc and support means carried by the front end of the housing structure and rotatably supporting the front end of the screw, said screw having a helical thread pitched to advance material in the bore rearwardly toward the milling chamber when the assembly comprising the rotor, disc and screw is rotated; said assembly having a driving shaft extending axially from its related end of the housing structure; and, a prime mover with an output shaft drivingly coupled with said driving shaft; said shearing blocks are shiftably radially inwardly from a normal out to in position relative to the disc and the rings whereby said blocks will shift radially inwardly and ride over hard materials engaged between the blocks and the rings and which are not reduced thereby.

4,141,511

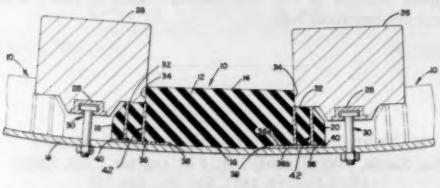
MILL LINING ELEMENTS

Robert D. Anderson, Aurora, Colo., assignor to Trelleborg Rubber Company, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 773,938, Mar. 3, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,686

Int. Cl.[2] B02C *17/22*

U.S. Cl. 241—183 **20 Claims**



1. A rotary mill lining element comprising a body of wear resistant resilient material having top and bottom surfaces and opposite sides and ends, and reinforcing means extending along and laterally adjacent each said sides of said body said reinforcing means including metal member means longitudinally coextensive with said body between said ends thereof, said reinforcing means further including projection means attached to said metal member means along and laterally adjacent each said sides of said body and extending from said metal member means into the material of said body in the direction between said top and bottom surfaces, and said metal member means and projection means extending from said top surface to said bottom surface of said body to provide a fixed dimension in said direction for said lining element along each said sides of said body.

4,141,512

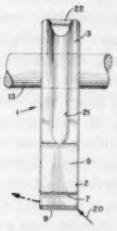
CONSTRUCTION OF A HAMMER FOR HAMMER MILL

Terry M. Francis, Niskayuna, N.Y., assignor to Adirondack Steel Specialties, a division of Adirondack Steel Casting Co., Inc., Watervliet, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,880

Int. Cl.[2] B02C *13/28*

U.S. Cl. 241—194 **5 Claims**



1. A hammer of the type adapted for use in a hammer mill for tearing ductile metal comprises

(a) a body having

(1) a base defining a working end, said working end having at least one working edge,

(2) a mounting end including a bore substantially equidistantly spaced from the surface of the body by a reinforced cross-section, said bore adapted for mounting the body and,

(3) a surface connecting opposite sides of said mounting end and said base, said connecting surfaces along substantially their length disposed substantially parallel with an axis through the body; and,

(b) a channel formed in said body along said connecting surfaces and around said mounting end, said channel and relieved connecting surfaces functioning to reduce the weight of said body in the portion removed from said base to locate the center of mass closer to said base.

4,141,513

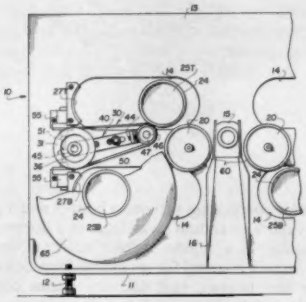
DEVICE FOR ACCELERATING YARN WINDER CHUCKS

Harry B. Miller, Charlotte, N.C., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,783

Int. Cl.[2] B65H *54/02, 54/42*

U.S. Cl. 242—18 A **10 Claims**

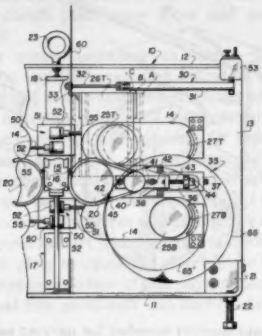


1. A chuck accelerating device, for use in a winder for yarn and the like of the type including at least one pair of axially spaced rotatable chucks each adapted to have at least one bobbin mounted thereon and including a respective drive roll operatively associated with each pair of chucks, with each chuck being movable from a retracted position through a standby position toward the associated drive roll for rotation of the respective chuck by engagement of a bobbin or bobbins thereon with the associated drive roll for winding of the yarn package on each bobbin, and being retractable from the drive roll, with one chuck of each pair being rotated by the drive roll while the other chuck is idle, and the idle chuck being moved past the yarn package or packages being wound onto one chuck to the standby position, in which it is adjacent to but out of contact with the drive roll, prior to the yarn package or packages being wound on the one chuck attaining a size interfering with such movement of the idle chuck: said chuck accelerating device comprising, in combination, a driven pulley; a drive belt trained around said driven pulley; means mounting said driven pulley for movement between a neutral position, in which said drive belt is spaced from the path of movement of both chucks of a pair, and a pair of operative positions, in each of which said drive belt is engaged with an idle chuck of each pair then in the standby position; means biasing said driven pulley to its neutral position and operable, upon signal, to move said driven pulley to a selected one of its operative positions; and drive means operatively associated with said drive belt and operable, when said driven pulley is moved through either one of its operative positions, to accelerate said driven pulley from standstill to an angular velocity in which the peripheral speed of said drive belt, and thus of the idle chuck engaged thereby, is substantially synchronized with that of said drive roll; the thus accelerated idle chuck being thereupon moved to engage a bobbin or bobbins thereon with said common drive roll for rotation by said common drive roll.

4,141,514
STANDBY CHUCK OPERATING MECHANISM

Harry B. Miller, Charlotte, N.C., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,051
Int. Cl.[2] B65H *54/02, 54/42, 67/04*
U.S. Cl. 242—18 A 10 Claims



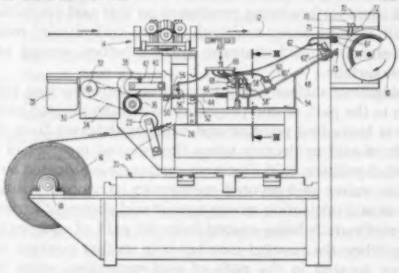
1. In a winder for yarn or the like including at least one pair of vertically spaced chucks, a common drive roll intermediate the chucks for rotating the chucks by engagement therewith or with a yarn package being wound on a bobbin mounted thereon, traverse means operable to cross-wind a yarn package on a bobbin, and respective means mounting each chuck for horizontal displacement from a retracted position, in which the associated chuck is spaced substantially from the common drive roll, and an active position in which the associated chuck, or a yarn package thereon, is in engagement with the drive roll, and vice-versa, and in which the yarn is fed to a bobbin, engaged with the drive roll, on an active chuck of each pair, to wind a yarn package thereon, while the other chuck of each pair is retracted from the drive roll, and is inactive, with the active chuck being displaced toward its retracted position as the yarn package increases in size, and with the yarn feed being transferred from the yarn package, when the latter is substantially fully wound, to the bobbin on the inactive chuck for winding of a new package thereon after such bobbin has been brought into contact with the drive roll to be rotated at high speed, with the size of the completed yarn package being limited due to the clearance needed for displacement of the inactive chuck and the bobbin thereon past the yarn package to engage the empty bobbin on the empty chuck with the drive roll: the improvement comprising, in combination, respective chuck displacing means operatively associated with each mounting means; the associated chuck displacement means operatively associated with an inactive chuck being operable to move the latter toward said common drive roll and past the yarn package being wound on the bobbin on the active chuck, while such yarn package has only a relatively small diameter, to a standby position closely adjacent to but out of contact with said common drive roll; said associated chuck displacement means, when such package is nearly fully wound, moving the inactive chuck from its standby position to a position in which the bobbin thereon engages said common drive roll; whereby yarn packages of substantially larger diameter can be wound on said chucks by virtue of the fact that the inactive chuck does not have to be moved past a substantially fully wound package from its retracted position to engage an empty chuck thereon with said common drive roll.

8. In a winder for yarn or the like including at least one pair of vertically spaced chucks, a common drive roll intermediate the chucks for rotating the chucks by engagement therewith or with a yarn package being wound on a bobbin mounted thereon, traverse means operable to cross-wind a yarn package on a bobbin, and means mounting each chuck for horizontal displacement toward and away from the common drive roll: the method of cross-winding a yarn package on an active chuck of each pair while the other chuck of each pair is inactive comprising the steps of feeding the yarn to a bobbin, engaged with the common drive roll, on the active chuck, for winding of a yarn package thereon; while such yarn package has only a relatively small diameter, moving the inactive chuck, from its fully retracted position, toward the common drive roll and past the yarn package into a standby position in which the inactive chuck is closely adjacent to but out of contact with the common drive roll; when the package is nearly fully wound, moving the inactive chuck to a position in which a bobbin thereon engages the common drive roll for rotation thereby; and, when the yarn package on the active chuck is completely wound, transferring the yarn feed from the completely wound yarn package to the empty bobbin on the inactive chuck; whereby yarn packages of substantially larger diameter can be wound on the chucks by virtue of the fact that the inactive chuck does not have to be moved past a substantially fully wound package.

4,141,515
AUTOMATED LAYER SEPARATOR DELIVERY SYSTEM FOR OPTICAL WAVEGUIDE WINDING

William E. Lock, Horseheads, and Jesse C. Thrower, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 2, 1977, Ser. No. 821,135
Int. Cl.[2] B65H *54/28*
U.S. Cl. 242—54 R 12 Claims



1. Apparatus for automatically inserting a separator sheet between concentric layers of an optical waveguide being wound upon a drum, comprising:

a supply roll of separator sheet material;

advancing means for engaging and advancing the sheet material along a path in increments corresponding to the length of separator sheet required;

sensing means disposed adjacent said drum and responsive to the lateral position of the waveguide being wound for producing an enabling signal;

cutoff means disposed in said path and responsive to said enabling signal for severing said sheet material after the advancement thereof;

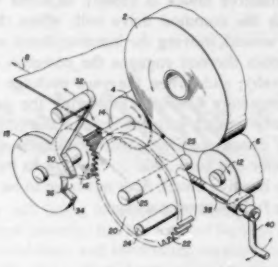
elongate guide means for retaining lengths of sheet material therein and conducting said sheet material from said cutoff means to the drum; and

nozzle means disposed in proximate relationship to said guide means for directing a stream of compressed air against the sheet material to urge the sheet material outwardly from said guide means.

4,141,516
DISPENSER FOR SHEET MATERIAL

Stephen R. Olson, Sioux City, Iowa, assignor to Iowa Beef Processors, Inc., Dakota City, Nebr.

Filed Jun. 1, 1977, Ser. No. 802,336
Int. Cl.[2] A47K *10/22, 10/34*
U.S. Cl. 242—55.53 12 Claims



1. Apparatus for dispensing uniform lengths of sheet material from a roll, comprising,

support means for rotationally supporting a roll of sheet material for dispensation,

a rotary member,

drive means responsive to rotation of said roll of sheet material for rotating said rotary member about a rotational axis in an amount proportional to the length of sheet material withdrawn from said roll of sheet material,

a projection affixed to and movable with said rotary member in a circular path upon rotation of said rotary member,

a pivoted member movable about a pivot axis from a first to a second position, an abutment surface and a reset surface affixed to said pivoted member, said abutment surface and said reset surface being positioned so that said projection while moving along said path toward said pivoted member arrives at said abutment surface before passing said reset surface,

said abutment surface being located at an obstructing position in the path of said projection when the pivoted member is in its first position and being withdrawn from the path of said projection when the pivoted member in its second position, said abutment surface being located so as not to move said pivoted member to its second position when said projection moves against said abutment surface,

said reset surface being spaced from the path of said projection when the pivoted member is in its first position and being located in the path of said projection when the pivoted member is in its second position,

means for moving said pivoted member about said pivot axis from said first position to said second position to withdraw said abutment surface from the path of said projection and to position said reset surface in the path of said projection, said reset surface being located to move said pivoted member and return said pivoted member to its first position when the projection moves thereagainst, whereby said abutment surface is returned to its obstructing position.

4,141,517
APPARATUS FOR ADJUSTING THE LATERAL POSITION OF A ROLLED WEB

Behzat Olcer, Ankara, Turkey, assignor to Martin Automatic, Inc., Rockford, Ill.

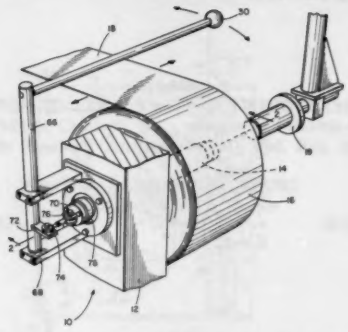
Filed Mar. 22, 1978, Ser. No. 889,024
Int. Cl.[2] B65H *75/24*
U.S. Cl. 242—68.3 10 Claims

1. Apparatus for adjusting the lateral position of a rolled web, said apparatus comprising, in combination:

a spindle for mounting said rolled web having at least a section thereof defining an inner space and at least one opening to said inner space;

a support member mounted within said inner space for lateral shifting thereof in relation to said opening;

at least one chuck member supported on said support member and movable through said opening between an extended position and a retracted position relative thereto;



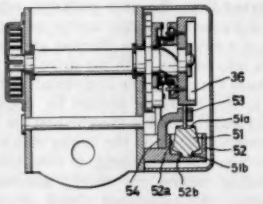
means on said support member for moving said chuck member between said extended position and said retracted position; and

means for laterally shifting said support member whereby said rolled web may be laterally adjusted when said chuck member is in said extended position.

4,141,518
SAFETY-BELT RETRACTOR

Chusaku Yamanashi, Kasai, Japan, assignor to Fuji Kiko Kabushiki Kaisha, Tokyo, Japan

Claims priority, application Japan, Oct. 21, 1974, 49-121204; Oct. 22, 1974, 49-121730; Oct. 22, 1974, 49-121731
Filed Oct. 22, 1975, Ser. No. 624,827
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A 8 Claims



1. A safety-belt retractor for use in a vehicle, comprising:

(a) take-up means for taking up a safety-belt and including a frame, a shaft rotatably supported by said frame and biasing means for winding the belt on the shaft;

(b) locking means coupled with said take-up means for selectively locking the same to prevent pulling-out of the safety-belt from the take-up means, said locking means including a first ratchet wheel fixedly mounted on said shaft and a pawl means rotatably mounted on said frame and including first and second pawls angularly disposed at a predetermined angle and connected for common movement, said first pawl being arranged to engage said first ratchet wheel by rotation of said pawl means;

(c) clutch means operatively associated with said locking means for selectively actuating the same to lock the take-up means, said clutch means including a clutch plate rotatably mounted on said shaft and having a periphery provided with a pair of projections which receive said second pawl therebetween, said clutch plate having a side wall with a pair of third pawls thereon, screw means fixedly

mounted on said shaft and having an external thread, a second ratchet wheel having an internal thread engaging the external thread of the screw means to advance therealong, said second ratchet wheel having a side wall with laterally projecting teeth thereon facing the third pawls on the side wall of the clutch plate, said second ratchet wheel having at least one hole therein, a spring disposed between said clutch plate and said second ratchet wheel to bias said clutch plate away from said second ratchet wheel; and

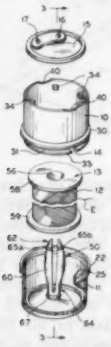
(d) detector means including an inertia disk rotatably mounted on said shaft, said disk including a rod slidably engaged in said hole in said second ratchet wheel such that in normal operation said inertia disk rotates together with said second ratchet wheel, whereas for rapid pull-out of the belt said inertia disk remains temporaritly at rest so that said second ratchet wheel rotatably advances along said external thread of said screw means towards said clutch plate and away from said inertia disk and said teeth of said second ratchet wheel engage said pair of pawls of said clutch plate to cause the clutch plate to rotate and thereby produce rotation of said pawl means and engagement of said first pawl with said first ratchet wheel.

4,141,519

THREAD STORAGE AND DISPENSING SYSTEM

Emanuel B. Tarrson, Chicago, and Stevan Tisma, Niles, both of Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Sep. 15, 1977, Ser. No. 833,441
Int. Cl.[2] B65H *49/18*
U.S. Cl. 242—137.1 **16 Claims**



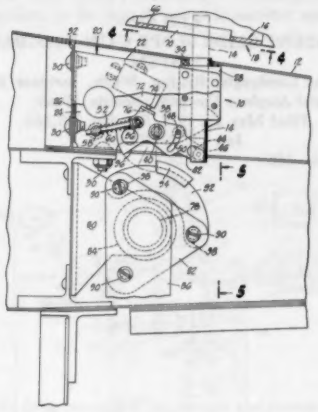
5. A thread holder comprising at least one shell part including a split post coaxially located therein to enable a rotation of a bobbin means mounted on said post, said bobbin means having a hollow, central cylindrical hub region with a cross section for receiving and embracing said split post, said split post having en enlarged cross section at least partially distributed along the longitudinal length thereof, for gripping the internal walls of said hollow, cylindrical region, said enlarged cross section includes a bulbous section near the longitudinal center of the post, the cross sections of said post and hollow hub region being proportioned for contacting and dragging with predetermined friction against a rotation of said bobbin, the friction being great enough to prevent an unwanted and random unwinding of thread from said bobbin and yet small enough to preclude any substantial opposition to a desired withdrawal of thread, means associated with said bulbous section for preventing said bobbin from tipping on said post, and means for preventing tipping comprising upper and lower beads formed above and below said bulbous section.

4,141,520

FAIL-SAFE LOCK FOR AN AIRPLANE RUDDER

Gene Beijer, North Hollywood; James S. Smith, and Ralph L. Sheffer, both of Arcadia, all of Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.

Filed Jun. 20, 1977, Ser. No. 808,027
Int. Cl.[2] B64D *47/00*
U.S. Cl. 244—83 A **16 Claims**



1. A locking mechanism for releasably fixing an airplane swingably mounted flight control surface means in a predetermined position, comprising:

(a) a lock bolt mounted in a body portion of the airplane adjacent the swinging path of movement of a portion of said flight control surface means, said lock bolt being supported for movements between a locking operative position in which an end thereof projects into the path of movement of said portion of the flight control surface means, and a non-locking operative position out of the path of movement of said portion of the flight control surface means;

(b) means for manually selectively actuating said bolt to said non-locking and locking (projected) positions including a member mounted adjacent an exterior surface of the fuselage near said flight control surface means and being accessible from the exterior of the airplane; and

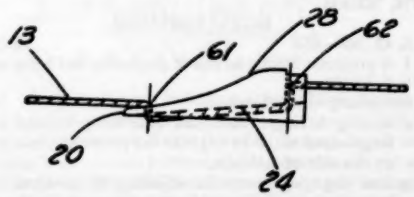
(c) a keeper carried by said portion of the flight control surface means, adapted to receive the projecting end of the bolt in said locking position.

4,141,521

KITE PARACHUTE TOY AND RELEASING DEVICE

Donald J. Waldvogel, N81 W14236 Eastwood Dr., Menomonee Falls, Wis. 53051

Filed Jan. 6, 1978, Ser. No. 867,526
Int. Cl.[2] B64C *31/06*; A63H *27/08*
U.S. Cl. 244—155 R **3 Claims**



1. A toy for a kite string including a toy releasing device wherein: said releasing device is triangular in shape, is made of

plastic and has a one piece construction and said releasing device comprises forward and rear eyelets for threading to said kite string, a pair of releasing surfaces projecting outwardly and rearwardly from said forward eyelet, a pair of releasing edges formed by the outermost area of said releasing surfaces, a concave underside formed by said releasing surfaces, and a top side that increases in height from said forward eyelet to said rear eyelet.

4,141,522

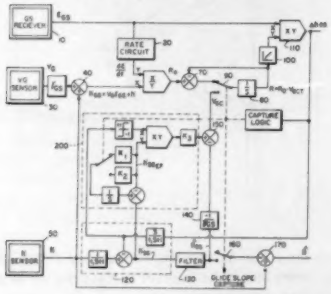
INDEPENDENT GLIDE SLOPE GAIN PROGRAMMING SYSTEM

Antonius A. Lambregts, Renton, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed May 16, 1977, Ser. No. 797,161

Int. Cl.[2] G05D *1/12*

U.S. Cl. 244—186 **8 Claims**



1. In an aircraft landing approach system utilizing ILS beam guidance information, a system for computing a signal representative of the altitude deviation of said aircraft from the ILS glide slope centerline comprising:

means for estimating the initial slant range of the aircraft relative to the ILS glide slope transmitter while approaching the glide slope centerline, from ground speed or airspeed, the angular slide slope deviation and sink rate;

means for estimating the actual ground speed from sink rate and linear glide slope deviation;

means for updating the slant range estimate utilizing said estimate of the ground speed;

means for computing the linear deviation from the glide slope centerline from the angular glide slope deviation and the updated slant range estimate, and linear glide slope error feedback means for correcting errors in the range estimation computation.

4,141,523

PROJECTOR HAVING AN ADJUSTABLE HEIGHT

Lothar Brendgens, Offenbach am Main, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,495

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 7626538

Int. Cl.[2] F16F *15/00*

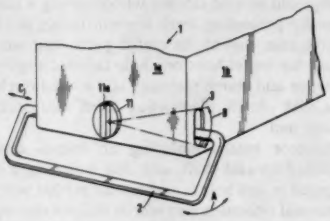
U.S. Cl. 248—653 **10 Claims**

1. A projector having an axis of projection and being adjustable in height,

comprising in combination:

a housing having a base, said base being formed with a longitudinal slit at an angle to the projection axis at least on one side of said base,

ground engaging means for adjusting the position of said base relative to the ground and being pivotable to a multiplicity of selected positions about at least one axis at an angle to the projection axis and to said slit, said ground engaging means projecting from said base and including a portion extending through said slit into said housing, and



clamping means operable for clamping said ground engaging means in any of said selected positions.

4,141,524

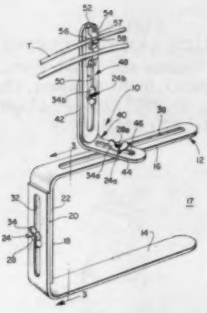
TUBE HOLDER FOR IMMOBILE PATIENTS

Louis Corvese, Jr., 220 Randall St., Cranston, R.I. 02920

Filed Feb. 28, 1977, Ser. No. 773,261

Int. Cl.[2] F16L *3/08*

U.S. Cl. 248—70 **1 Claim**



1. A device for promoting unassisted immobile patient drinking and the like, said device comprising frame components including a base supporting member, a bracket and an extension and at least one tube, said base supporting member of generally U-shaped configuration having two substantially equal length generally parallel opposed legs and a connecting web defining an open end adapted for receipt of anchoring means such as a mattress or the like, with one of said legs disposed beneath said anchoring means and the other leg being disposed above said anchoring means and forming an upper free end leg, said upper free end leg thereof having said bracket pivotally mounted thereto, said bracket being of L-shaped configuration with the upright portion of said bracket disposed generally normal to said upper leg of said supporting member, said bracket having an upper generally elongated extension mounted at one end thereof to the upright portion of said bracket for pivotal movement with respect thereto, said bracket adjustably and longitudinally slidable with respect to said base member free end, and said extension adjustably longitudinally slidable with respect to the upright portion of said bracket, including means for slidably adjusting said bracket with respect to said base member and said extension with respect to said upright portion, said last means including a pair of open longitudinally extending slots disposed in at least partial alignment with each other for receipt of bolt means passing therethrough and adapted to clamp said bracket and extension respectively to said base member and said upright portion, the other end of said extension having holding means for supporting a running length of at least one tube, said tube generally

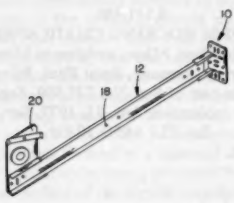
transversely disposed to said holding means and having one end for contact by said patient and the other end for receipt in a supply of drinking fluid and the like, said extensions being a flat relatively narrow material strip, said other extension end terminating in a downwardly extending loop having a rear strip portion and a front strip portion integrally connected to each other by a top 180° reverse bend connecting portion, and forming said holding means, said front strip portion gradually downwardly rearwardly extending so that the terminal edge of said front portion contacts the front of said rear strip portion along a line downwardly displaced from said bent connecting portion so as to form a closed upper end wedge shaped opening between said rear and front portions, the flat opposed surfaces of said front and rear portions comprising said holding means, said tube positioned through said loop with opposite sides thereof contacting and wedgingly received by said opposed surfaces of said front and rear strip portions, said base member comprising a pair of L-shaped sections slidably interconnected to form said connecting web and means for fixedly positioning said sections including an open longitudinally extending slot disposed through each said section, said slots at least partially aligned for receipt of a bolt passing through said sections and having a bolt head non-rotatably positioned in one of said slots and a shaft for receipt of nut means on the other side thereof.

4,141,525

UNIVERSAL DRAWER SLIDE MOUNTING BRACKET

Calvin K. Miller, Grand Rapids, Mich., assignor to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Filed Nov. 10, 1977, Ser. No. 850,407
Int. Cl.² A47B *88/00*
U.S. Cl. 248—251 **1 Claim**



1. An omni orientation mounting bracket for selective multiple position use to support a drawer rail assembly, comprising:

a one piece bracket having a channel sleeve to interfit with a drawer rail, and a mount plate for cabinet attachment; said channel sleeve having a back panel and a pair of side panels transverse to said back panel; said mount plate being integrally joined with said channel sleeve at said back panel along a linear juncture, and having a plurality of peripheral edges; said mount plate having plate portions and at least two bend lines, one of which bend lines is along said linear juncture and the other of said bend lines between said plate portions to allow said mount plate portions to be positioned in selected orientation relative to said channel sleeve; said bend lines having aligned spaced orifices and isthmuses therealong.

4,141,526

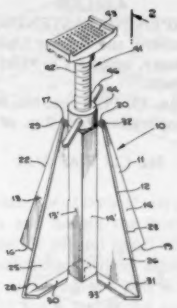
INTERLOCKING JACK STAND

Julius F. John, Redondo Beach, Calif., assignor to Norco Industries, Inc., Gardena, Calif.

Filed Aug. 9, 1977, Ser. No. 823,177
Int. Cl.² F16M *13/00*
U.S. Cl. 248—352 **5 Claims**

1. An interlocking jack stand comprising side members providing a central hollow column, each side member comprising leg means of sheet metal of substantially uniform thickness and having a width tapering from a relatively narrow top to a relatively wide base, inside vertical edges of legs of said members having a releasable interlocked engagement with said hollow column at the perimeter of said hollow column, horizontal edges at the base of said legs being at an angle with respect to each other and forming a supporting base, horizontal edges at the tops of said legs being at a corresponding angle with respect to each other and forming an upwardly facing supporting platform,

two legs for each side member comprising flat plates in right angular relationship and forming a vertical junction, there being slots in the legs of one side member extending in-



wardly from one end of the column and slots in the legs of the other side member extending inwardly from the opposite end of the column, the slots being spaced from the vertical junction enabling formation of a vertical chamber when the side members are interlocked,

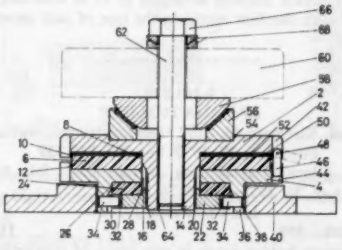
said vertical junction being a corner edge and said vertical chamber having a rectangular cross-sectional shape, said column having a height many times greater than the width of the column and greater than the width of the supporting base.

4,141,527

VIBRATION DAMPER

Hans Wolf, Köslinstr. 49, 3300 Braunschweig, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,406
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623819
Int. Cl.² F16F *13/04*
U.S. Cl. 248—562 **13 Claims**



1. A vibration damper including a base flange having a threaded bore, a supporting flange having a generally central opening, said supporting flange threadably engaged with said base flange bore wherein portions of said supporting flange are upwardly spaced over said base flange and whereby said supporting flange is axially adjustable with respect to said base flange, an upper and a lower damping element each having a central opening respectively engaging an upper and a lower

face of said supporting flange, a mounting flange supported on top of said upper element, said mounting flange having a downwardly extending central part positioned through said openings in said elements and siad supporting flange, an abutment having an upper surface positioned against the lower face of said lower element, said central part of said mounting flange threadably connected to said abutment, and means between said abutment and said supporting flange for permitting relative axial movement therebetween but preventing relative rotational movement therebetween.

4,141,528

SOUND DAMPENING FASTENING ELEMENT

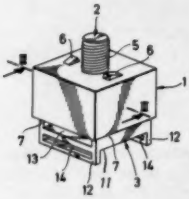
Armin Herb, Peissenberg, and Raimer Uhlig, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jan. 13, 1978, Ser. No. 869,260

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1977, 2702765

Int. Cl.[2] F16F *9/10*

U.S. Cl. 248—560 **10 Claims**



1. Sound dampening fastening element comprising a sound dampening body, an anchoring member embedded in said dampening body, and a support member located within and extending outwardly from said dampening body, said support member including a threaded opening for receiving a threaded member, wherein the improvement comprises that said support member includes a pair of first walls, said first walls each comprising a first wall section located on an opposite side of said anchoring member from the other said first wall section, and a second wall section extending from each said first wall section and disposed in overlapping engagement with the other said second wall section, said second wall sections being located within said dampening body, said second wall sections being shaped so that one of said second wall sections interlocks into the other said second wall sections, and one of said second wall sections has at least one first recess formed therein and the other one of said second wall sections has a complementary shaped projection thereon arranged to fit in interlocking engagement with the first recess in the one of said second wall sections.

4,141,529

BANANA HOLDER

Toni Casutt, Kirchweg 46, 8102 Oberengstringen, Switzerland

Filed Jun. 28, 1977, Ser. No. 810,739

Claims priority, application Switzerland, Jul. 6, 1976, 8663/76; Aug. 31, 1976, 11048/76

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—359 **11 Claims**

1. A banana holder made in one piece of synthetic plastic comprising, in combination:

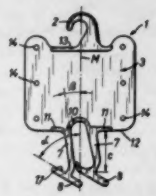
a flat body portion (3) having a labelling surface;

a hook (2) for hanging the holder and its load, said hook extending upward from said body portion (3);

a plurality of flexible arms (7) spaced from each other and extending downward from said body portion (3) being flexible at least in the region of their downward ends, and

a cross arm (8) at the downward end of each of said flexible arms (7) for grasping into a banana bunch near the region (16) thereof in which the banana stems have grown together,

said downward ends of said flexible arms (7) and the respective junctions with said cross-arms (8) being so shaped that said cross-arms are oblique to the general direction of said flexible arms (7) in the unloaded condition of the banana holder, and



the flexibility of said flexible arms (7) or said barbs being sufficient to change the shape of said flexible arms so as to bring said cross-arms into substantially horizontal orientation under the weight of a banana bunch after insertion of said cross-arms and flexible arms into said banana bunch.

4,141,530

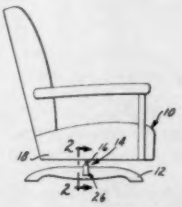
PLATFORM ROCKING CHAIR SPRINGS

Gene R. Ward, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 727,650, Sep. 29, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,487

Int. Cl.[2] A45D *19/04*

U.S. Cl. 248—629 **9 Claims**



1. Spring means for mounting a chair seat on a platform to function as a platform rocking chair, said spring means comprising:

a pair of substantially flat fiber-reinforced plastic springs having a lengthwise fiber-reinforcing component of 50–95% and a crosswise reinforcing component of at least 5%,

brackets for fixing one end of each spring to a side of the platform and the other end centrally to a side of the seat box or other lateral support for the chair seat such that the springs provide the sole support for the chair seat,

each of the flat springs having an effective free length of 6–20 cm, a width at least four times its thickness and a compressive strength of at least 350,000 kPa, a flexural strength of at least 350,000 kPa and a flexural modulus of 13 to 55 $\times$ 10^6 kPa in the lengthwise direction, the center of the effective free length of each spring being closer to the floor than to the upper surface of the chair seat.

4,141,531
DISC RECORD PRESS

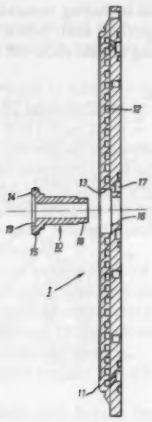
Hermann Strausfeld, Cologne, Fed. Rep. of Germany, assignor to EMI Electrola Gesellschaft mit beschrankter Haftung, Cologne, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,515

Claims priority, application United Kingdom, Feb. 29, 1976, 3617/76

Int. Cl.[2] B29D *17/00*; B29C *17/00*

U.S. Cl. 249—80 **9 Claims**



1. A disc record press mould member to which mould member, in operation of the press, a record moulding matrix is attachable in thermal contact with one surface of the mould member to be supported by said one surface, and which mould member has at least one internal channel for a temperature control fluid usable to adjust the temperature of the matrix, the mould member being composed of parts of different thermal conductivity materials assembled in heat conductive relationship, one of said parts formed of a material selected to have a higher thermal conductivity being provided between the channel and said one surface of the mould member where the path length to the surface is relatively great, and a further one of said parts formed of a material selected to have a lower thermal conductivity being provided between the channel and said one surface of the mould member where the path length to the surface is relatively small, thereby to reduce the delaying effect of the longer path length on the time elapsing before the temperature of the record moulding matrix is adjusted to a uniform value by the heat flow along said paths from temperature control fluid in said channel.

4,141,532
FRAME STRUCTURE FOR CASTING CONCRETE

Harlin J. Wall, State College, Pa., assignor to Leisure Life, Inc., State College, Pa.

Continuation-in-part of Ser. No. 741,016, Nov. 11, 1976, abandoned. This application Oct. 18, 1977, Ser. No. 843,344

Int. Cl.[2] B28B *7/22*

U.S. Cl. 249—94 **43 Claims**

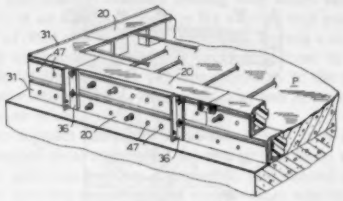
1. A frame structure for casting a concrete building panel, comprising:

a plurality of panel edge molding frame members each having a generally U-shaped cross-section;

a plurality of panel corner frame members each having a configuration which, when viewed in plan, corresponds to the angle of the corner of the panels to be molded thereby;

said panel edge molding frame members and said panel corner frame members being assembled in a panel molding frame with a number of panel edge molding frame members along the portions of the frame corresponding to the edges of the panel to be molded sufficient to equal the length of the corresponding edge of the panel, with the ends of the panel edge molding frame members abutting the panel corner frame members, and with the opening of the U-shaped cross-section of said panel edge molding frame members facing inwardly of the panel molding frame;

connecting means rigidly connecting said panel edge molding frame members to each other and to said panel corner frame members; and



liner means in the interior of each of said panel edge molding frame members and having the inner portions thereof abutting the interior of said panel edge molding frame members for positioning said liner means in the panel edge molding frame members, and the surfaces of the liner means facing the space within the panel molding frame having a shape complementary to the shape of the edge of the panel to be molded by the use of said frame structure, said panel molding frame, said connecting means, and said liner means together constitute a panel molding frame unit.

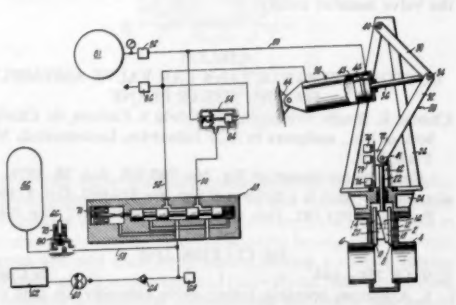
4,141,533
HYDRAULICALLY OPERATED SHUTOFF VALVE

Robert B. Goodman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 748,841

Int. Cl.[2] F16K *31/124*

U.S. Cl. 251—58 **9 Claims**



1. An actuating system for a hydraulically actuated valve requiring high pressure actuation to seal the valve when closed including:

a wedge actuated valve,

a hydraulic actuator for moving said valve between open and closed positions,

an accumulator for storing fluid under pressure for use in the hydraulic actuator,

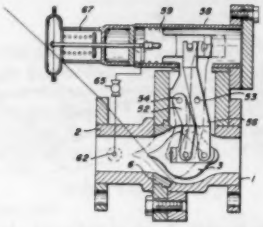
pump means to pressurize the accumulator, and

means responsive to movement of the valve and operative when the valve reaches closed position to isolate the accumulator from said pump means and said actuator and apply full pump pressure directly and fully to the actuator.

4,141,534
OVAL SHAPED VALVE WITH BALANCING PILOT PISTON

Atsushi Goga, Kawasaki; Takefumi Ikui, Fukuoka; Mikio Obi, and Shinya Kameda, both of Tokyo, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Jul. 23, 1976, Ser. No. 708,114
Int. Cl.[2] F16K *31/16*
U.S. Cl. 251—58 2 Claims



1. A valve for controlling fluid flow comprising a valve body having a chamber, an oval-shaped valve member disposed within said chamber for valve opening and closing operation, said chamber having a configuration corresponding to said oval-shaped valve member and provided with primary and secondary sides at opposite sides of said valve, a pilot cylinder disposed within said valve body, a pilot piston in said pilot cylinder, a connecting member connecting said valve member and pilot piston, said pilot cylinder being provided with spaces on opposite sides of said pilot piston, means connecting one of said spaces with the primary side of said valve and means connecting the other of said spaces with the secondary side of said valve, whereby the unbalanced force acting on the valve member when the valve member is opened or closed in counteracted by the forces acting on said pilot piston by the pressures in said spaces, and wherein a driving lever is supported by a pin carried by the body, opposite ends of said lever being connected with the pilot piston and the valve member respectively, a follower lever pivotally supported in said body and having an end connected with the valve member, whereby the driving lever and the follower lever cooperate to displace the valve member axially.

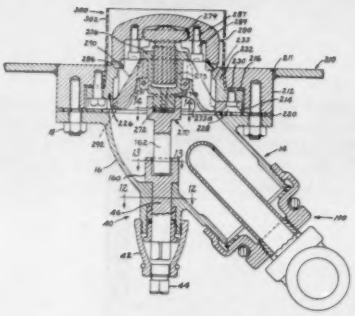
4,141,535
BOTTOM OPERABLE TANK CAR VALVE ASSEMBLY HAVING SHEAR PLANE

Charles E. Reedy, Bridgeton, and Edwin S. Carlson, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 700,105, Jan. 28, 1976, abandoned, which is a division of Ser. No. 513,082, Oct. 8, 1974, Pat. No. 3,981,481. This application Jun. 8, 1977, Ser. No. 804,663
Int. Cl.[2] F16K *1/48*
U.S. Cl. 251—144 19 Claims

1. A bottom operable lading valve assembly for tank cars comprising:

a valve body adapted to be integrally attached to an opening in the bottom of a tank; said valve body having a valve body opening therein; a retainer fitting within said valve body opening, including a flange portion and means for attaching said retainer to said valve body, said retainer including at least one retainer rib extending radially inwardly from said flange portion and terminating in a retainer connection portion having a center hub; a valve plug movable between open and closed positions relative to a circular plug seat located within said valve body opening, a housing affixed to said valve body with fastening means comprising a shear plane; said housing having a generally vertical housing opening therein into which a rotatable valve operator is mounted comprising a lower tool connection portion, a shaft portion and an upper operating portion; said center hub slidingly engaging said upper operating portion to allow rotation of said upper operating portion while maintaining said upper operating portion spaced from said valve body and vertically fixed; said upper operating portion having upper operator threads for engaging a valve plug operating stem depending from said valve plug having stem threads which engage said upper operator threads; said upper operating portion and said stem terminating above said shear plane; said shaft portion including separating means for separating said valve operator shaft below said shear plane in the event said housing should shear off along said shear plane;

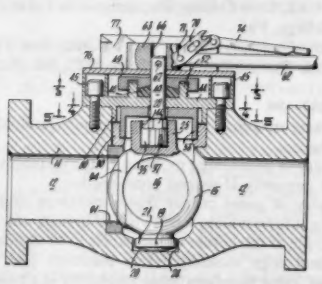


whereby rotation of said valve operator in a first direction causes said plug to move toward open position; closure plug stop means which engage when said plug assumes the full open position; and whereby rotation of said valve operator in open position in a second direction, opposite to said first direction, causes said plug to move to a closed and seated position; and whereby when said closure plug is in closed position severe impacts to said outlet will cause said housing and a portion of said valve operator shaft to separate from said outlet generally below said shear plane, thereby tending to maintain said valve plug in the closed, seated position and maintain any lading within the tank during and after such impact.

4,141,536
BALL TYPE VALVE WITH HIGH PRESSURE SEALING CAPABILITY

William J. Graham, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,263
Int. Cl.[2] F16R *25/00*
U.S. Cl. 251—161 3 Claims



1. In combination with a ball type valve for use in high pressure or severe conditions, said valve having a valve handle

and a spherical core cooperating with a valve seat in a body with a fluid passage therethrough, said core being rotatable about an axis transverse to said fluid passage and having an opening therethrough for alignment with said passage when in the fully open position, and said core being also rotatable a limited amount about another axis tangential to said core for forcing it against said seat, the improvement comprising

a short stem on said core coaxial with said transverse axis,

a pair of parallel flat faces on the outside of said stem and lying transverse to the axis of said opening through the core,

an axially located recess in said stem,

said recess having a radially contoured cam surface on the walls thereof,

a cam operatively related to said cam surface and integrally attached to one end of a shaft for connecting the cam to said handle,

said shaft having a hexagonal element integral therewith located adjacent to said cam,

an inverted cup-shaped cylindrical element having a complementary hexagonal opening for cooperating with said hexagonal element and located axially in the bottom of said cylindrical element,

said cylindrical element having a pair of parallel flat faces on the inside for cooperating with said stem flat faces to cause said stem and cylindrical element to rotate together at all times while permitting lateral movement of said stem relative to said cylindrical element,

a pressure seal mounted on said valve body and supporting said shaft, and

a lever associated with said handle for shifting said shaft longitudinally from one position with said hexagonal element engaged in said hexagonal opening in order to be able to rotate said core to and from the fully opened position by rotating said cylindrical element,

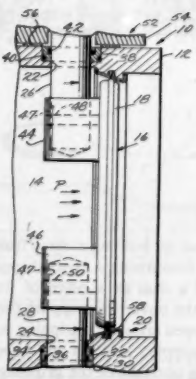
said shaft rotating said cam relative to said stem when shifted to the other position so as to force said core against said seat by rotating the core a limited amount about said tangential axis.

4,141,537

VALVE SEAT CONSTRUCTION FOR BUTTERFLY VALVES

Joseph L. Daghe, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Dec. 30, 1975, Ser. No. 645,455
Int. Cl.[2] F16K *1/226*
U.S. Cl. 251—306 **13 Claims**



1. A butterfly valve assembly capable of having fluid flow therethrough in either direction, said butterfly valve assembly comprising:

a body member having a passage therethrough for flow of fluid in either direction;

a valve disc having an annular resilient sealing ring fixedly secured to its periphery, said valve disc being supported in said passage for movement between a first position in which said passage is open to flow of fluid and a second position in which said passage is closed to flow of fluid;

a corrosive resistant metal valve seat supported in the fluid passage in said body member, said valve seat having an annular tapered surface portion arranged to cooperate with said annular resilient sealing ring when said valve disc is in said second position for closing said passage to flow of fluid and said metal valve seat having a cross-sectional thickness progressively decreasing from its smaller end to its larger end to provide flexibility to the same to enhance sealing with said sealing ring and to compensate for wear of said sealing ring; and,

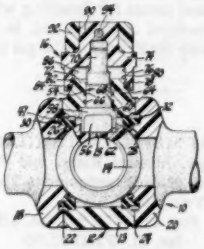
means to support said metal valve seat in said body member for limited axial movement relative to said body member when said disc member is moved to said second position and to provide a compressive seal between said valve seat and said body member when fluid flow is in a direction from the larger end toward the smaller end of said valve seat and to provide a fluid actuated seal between said valve seat and said body member when fluid flow is in an opposite direction from the smaller end to the larger end of said valve seat.

4,141,538

SEAL ASSEMBLY FOR VALVES

Earl A. Bake, and Leonard J. Stephens, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 614,195, Sep. 17, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,412
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—315 **5 Claims**



5. A ball valve assembly comprising: an all-plastic valve body including a main body section and oppositely disposed end sections, one of said end sections being separately fusible to the main body section, said end sections having flow passages therein and said main body section having a central valving chamber, said flow passages and said valving chamber defining in assembly a fluid flow path through said body, said one of said end sections and said main body section having fusible annular projecting surfaces thereon; a ball member in the valving chamber having a through port, said ball member being rotatable between positions where it blocks and provides fluid communication between said flow passages, means for rotating said ball member; a first seat element retained in the valving chamber by a first seat retainer; a second seat element retained by a second seat retainer, said ball member being continuously engaged by said seat elements; telescoping cylindrical surfaces on said main body section, said one end section and said second seat retainer capable of sliding engagement to limit relative movement therebetween to axial movement of said sections during fusing of said projecting surfaces whereby said main body section and said one end section are properly

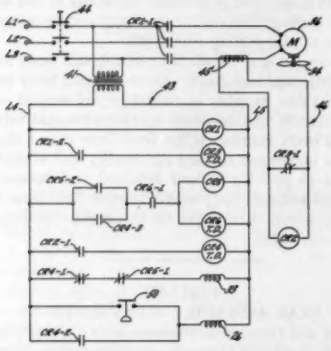
radially positioned with respect to each other during the fusing operation to provide a unitary valve assembly with said flow passages correctly radially aligned with said seat elements.

4,141,539

HEAT TREATING FURNACE WITH LOAD CONTROL FOR FAN MOTOR

June R. Bornor, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Nov. 3, 1977, Ser. No. 848,207
Int. Cl.[2] C21D *1/76*; F27D *19/00*
U.S. Cl. 266—78 **8 Claims**



1. A heat treating furnace having a chamber, said chamber having an inlet for admitting a flow of gas into the chamber and having an outlet for exhausting said gas from the chamber, the density of the gas in the chamber being reduced when the exhaust rate of the gas is greater than the admission rate, a fan for circulating the gas within the chamber, a motor connected to drive said fan, and means for detecting when said motor is approaching an overload condition and, in response to such detection, for causing the density of the gas in said chamber to be reduced.

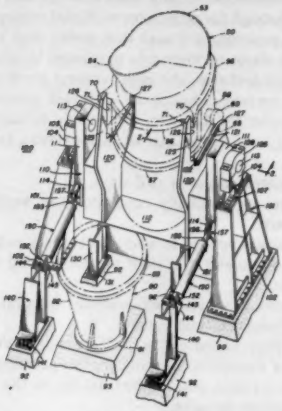
4,141,540

HOT METAL LADLE TILTER

William C. Kroeger, Mineral Ridge, and Stephen J. Roper, Youngstown, both of Ohio, assignors to The William B. Pollock Company, Youngstown, Ohio

Filed Aug. 29, 1977, Ser. No. 828,828
Int. Cl.[2] F27D *15/00*
U.S. Cl. 266—276 **15 Claims**

1. A hot metal ladle tilter for controlled tilting of a ladle with a pouring spout and having trunnions extending laterally therefrom on either side of the pouring spout and two support brackets respectively disposed thereon and spaced below the trunnions and an abutment bracket disposed thereon between the pouring spout and the axis of the trunnions, said tilter comprising a support stand having spaced-apart bearings thereon defining a generally horizontal tilt axis, a ladle support frame pivotally mounted on the bearings on said support stand for tilting about the tilt axis, said ladle support frame including two spaced-apart support members each having a support surface for readily removably receiving thereon respectively the support brackets of a ladle to be tilted, each support surface being open at the end thereof away from the ladle pouring spout and being provided adjacent to the opposite end thereof with an upstanding abutment surface for engaging the abutment bracket on a ladle to be tilted and cooperating with said support surface to form a generally L-shaped support seat, the ladle being freely supported on said support seats of said ladle support frame and being maintained thereon solely by gravity and being receivable thereon and removable therefrom in any tilt position of said support frame, and a motor for tilting said ladle support frame with a ladle of hot metal thereon about the tilt axis to lower the pouring spout of the ladle to a predetermined point to permit skimming of the slag from the surface of the hot metal in the ladle.

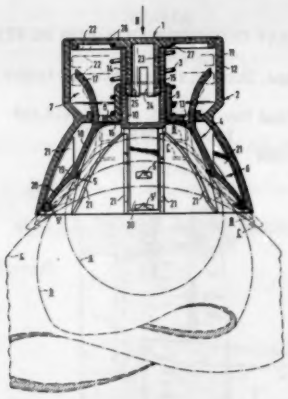


4,141,541

HAND UTENSIL FOR HOLDING A CITRUS FRUIT

Peter Ackeret, Kusnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,163
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656732
Int. Cl.[2] B25B *1/20*
U.S. Cl. 269—6 **16 Claims**

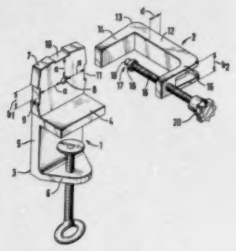


1. A hand utensil for holding a citrus fruit or a piece of citrus fruit, the utensil comprising a bowl-shaped cover for placing over the skin of a fruit or a piece of fruit, gripping means mounted within the cover for gripping the fruit and including a plurality of gripped arms with gripping portions and movable between a first gripping position and a second releasing position, the gripping portions of the gripping arms being further from the axis of the cover in the releasing position than in the gripping position, the arms being movable along the bowl-shaped cover while moving between said first gripping and second releasing positions.

4,141,542
CLAMPING APPARATUS FOR WORKPIECES

Robert Wolff, Im Kiesacker, 5446 Engeln, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,291
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746401
Int. Cl.² B25B 1/22
U.S. Cl. 269—88 4 Claims



1. A clamping apparatus for clamping a workpiece onto a table top or workbench comprising:

a C clamp element and a U clamp element;

said C clamp element having one leg adapted as a guiding ledge, a straight back, a threaded screw element to attach it to a table top or workbench threadedly engaging a bottom leg and an upwardly projecting stop having a centrally located aperture therein;

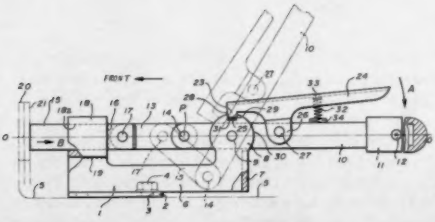
said U clamp element having a U-shaped body portion, a straight back having a width b_2, two legs and a threaded screw element fitted with a centering head at one end thereof and a knob at the other end thereof, said screw element engaging a threaded orifice in one leg of said U clamp element; and

said centering head of said threaded screw element being adapted to fit into the centrally located aperture of said upwardly projecting stop of said C clamp element whereby the workpiece may be fitted and thereafter secured within the right angled receiving space between the guiding ledge and the projecting stop or suspended at the back of said projecting stop with the U clamp element encircling said workpiece.

4,141,543
TOGGLE CLAMP DEVICE

Kazuyoshi Kato, 234, Dogashiba-cho, Tennozi-ku, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,636
Claims priority, application Japan, Feb. 12, 1976, 51-14444
Int. Cl.² B25B 1/14
U.S. Cl. 269—228 7 Claims

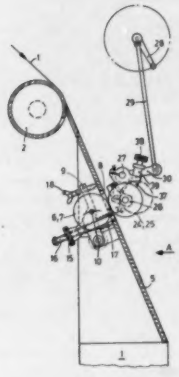


1. A toggle clamp device for locking work-pieces in a fixed position comprising a base bracket having at least one fixed pin thereon, means for clamping the workpieces together, a handle member mounted for movement relative to said fixed pin, a toggle linkage including a movable link actuated by said handle member and provided with a first pin movable with said link, said clamping means having a second pin movable by said link when said link is moved by said handle member, said clamping means being movable, in response to continuous, one directional movement of said handle member, from a position of less than maximum clamping force to a position of maximum clamping force and then to a portion of less than maximum clamping force, said clamping means being in the position of maximum clamping force when said fixed pin, said first movable pin and said second movable pin are in linear alignment with one another, and comprising a biased claw means pivotally mounted on said handle member, one element of said toggle device being provided with a notch for receiving said claw means when the clamping means are in the clamping position and the fixed pin and first and second movable pins are in linear alignment.

4,141,544
APPARATUS FOR LONGITUDINAL DEFORMATION, FOR EXAMPLE BY CREASING OR PERFORATION, OF PAPER WEBS PRIOR TO FOLDING

Helmut Birkenmayer, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Continuation of Ser. No. 780,672, Mar. 23, 1977, abandoned, which is a continuation of Ser. No. 596,448, Jul. 16, 1975, abandoned. This application Sep. 1, 1977, Ser. No. 829,820
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1974, 2435971
Int. Cl.² B65H 45/22
U.S. Cl. 270—86 14 Claims



1. Folding apparatus for one or a plurality of superimposed paper webs (1) which are guided over a folding triangle (5) having a center line terminating in a folding apex, a first side facing the paper webs, and an obverse side remote from the web, and including deformation apparatus having a roller pair (6, 24; 7, 25) including a deforming roller (6, 7) and a counter roller (24; 25),

wherein the folding triangle comprises a folding element (5) formed with an opening (8) extending along the center line thereof; and

deforming roller support means (9, 10) are provided located at the obverse side of the folding triangle and adjustabley supporting the deforming roller (6, 7) substantially centrally of the folding triangle (5), said deforming roller extending through said opening (8) from beneath the obverse side,

said deforming roller support means comprising a pivot lever (9) and means journalling the deforming roller (6, 7) on the pivot lever,

bearings (13, 14) secured to the folding element (5) and a shaft (10) secured in said bearings and pivotally holding said pivot lever therein,

and means (12, 14) axially moving said shaft (10) with respect to said bearings and hence with respect to the location of said bearings on the folding element to adjust the position of the deforming roller (6, 7) transversely with respect to the apex of the folding triangle (5);

the counter roller (24, 25) being located at the first side of the folding triangle and being engageable with the deforming roller in the absence of a paper web between the deforming roller and the counter roller.

4,141,545

PAPER FEED FOR COPYING MACHINE

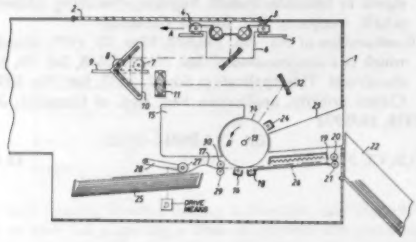
Gunther Schnall, Eching; Klaus Aldenhoven, Unterpfaffenhofen, and Hanns Blochl, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,506

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649673

Int. Cl.[2] B65H *3/06*

U.S. Cl. 271—118 **14 Claims**



1. A copying apparatus comprising:

a housing;

a paper tray on said housing adapted to hold a stack of copy sheets;

a rotatable pickup roller pivotal into and out of engagement with the uppermost sheet of said stack;

a pickup cam follower linked to said pickup roller;

a pickup cam engageable with said pickup follower and having a pickup cam portion;

means for rotating said pickup cam in a forward rotational direction and in an opposite reverse rotational direction; and

means including a pickup deflector for travel of said pickup follower along said pickup cam portion during forward rotation of said pickup cam with concomitant pivoting of said pickup roller into engagement with said uppermost sheet and for travel of said pickup follower during reverse rotation adjacent said pickup cam portion without concomitant pivoting of said pickup roller into engagement with said uppermost sheet.

4,141,546

MINI-COLLATOR/SORTER

Carl A. Queener, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 710,835, Aug. 2, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,719

Int. Cl.[2] B65H *29/60, 31/24*

U.S. Cl. 271—173 **22 Claims**

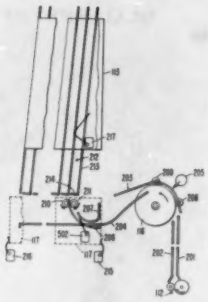
1. A collator/sorter for distributing sheets comprising:

a plurality of stationary, essentially vertically oriented sheet receiving bins,

each of said bins having a bottom opening for enabling automatic sheet insertion and a top opening for enabling manual sheet removal,

a sheet drive means located upstream of said bins,

stationary, passive sheet guide means extending essentially horizontally under said bottom openings of said bins and extending upstream to a position adjacent to said sheet drive means, said guide means supporting said sheets for movement therealong under drive imparted to the sheets by said drive means,



single sheet deflector means mounted for travelling along said sheet guide means including feeding means for positively feeding sheets from said sheet guide means directly upwardly into each of said bins, and

means controlling said deflector means for selectively feeding predetermined numbers of sheets into said bins.

4,141,547

MAGNETIC CONTROL CLOSURE SYSTEM

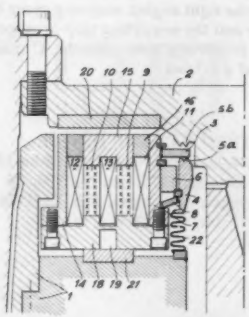
Claude E. D. Duquenne, La Garenne, and Joseph Plotkowiak, Carrieres sur Seine, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jul. 13, 1977, Ser. No. 815,281

Claims priority, application France, Jul. 20, 1976, 76 22785

Int. Cl.[2] F16J *9/00*

U.S. Cl. 277—30 **6 Claims**



1. A closure system for the rotor of a rotating machine for conveying a toxic fluid comprising an annular seal in a plane at right angles to the axis of rotation of the machine, said seal being clamped in an active position between stationary knife-edges on the rotor and movable knife-edges carried by an annular support member moving along the axis of the machine, the movable support member being displaced by magnetic means between an inactive position in which said member is separated from the rotor and the active position in which said member is coupled to the rotor as a result of magnetic forces of attraction, and the magnetic means having a second stable state of attraction in which the movable support member is maintained at a distance from the rotor in the inactive position and wherein the magnetic means exhibit symmetry of revolution and have two windings, one winding having two coils in series

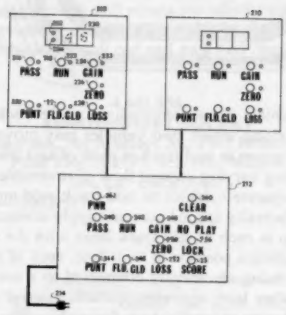
on each side of two annular permanent magnets, the other winding being a coil between the two permanent magnets for demagnetization and reversal of the residual magnetism of one of the permanent magnets.

4,141,548

GAME APPARATUS FOR USE IN CONJUNCTION WITH THE VIEWING OF A SPECTATOR'S SPORT

Irving M. Everton, 1701 Brookcliff Dr., Greensboro, N.C.

Filed Jan. 16, 1978, Ser. No. 869,526
Int. Cl.[2] A63B *71/04;* A63F *7/00*
U.S. Cl. 273—1 E **14 Claims**



1. An electronic game playable by one or more participants in conjunction with the observance of a football game, said observance being in person, by watching television, or by listening to the radio, said game comprising:

(a) at least one prediction panel having at least two sets of switches thereon a first set of said sets having designations associated therewith corresponding to various types of plays which may occur in a football game, the second of said sets having designation associated therewith corresponding to various outcomes which may occur during said plays, and a score display means for maintaining a cumulative score record thereon;

(b) a control panel including a first set of result signal switches corresponding and electrically connected to the first set of switches on said prediction panel and a second set of signal switches corresponding and electrically connected to the second set of switches on said prediction panel for initiating the transmission of a control signal to said prediction panel indicative of the actual play occurring and the actual outcome thereof;

(c) an electrical circuit means associated with said prediction panel and said control panel for comparing prediction data from said prediction panel and outcome data from said control panel and adjusting said scoring display means responsive to the results from said comparison.

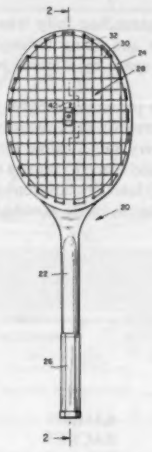
4,141,549

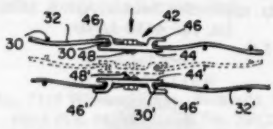
TENNIS RACKET

Thomas J. Hayes, 54-12 Kissena Blvd., Flushing, N.Y. 11355, and William M. Reed, 229 East 81st St., New York, N.Y. 10028

Filed May 19, 1977, Ser. No. 798,362
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **5 Claims**

1. A racket suitable for use in propelling a game projectile, the racket comprising a stem portion and a head portion, said head portion including a frame member having an inner margin defining an included area, said frame member supporting projectile propelling means within said included area for providing an impact zone to contact with the game projectile, the propelling means further including a plurality of longitudinal string lengths and a plurality of transverse string lengths forming duplicate striking matrices, said matrices being substantially coplanar respectively with a front and a rear face of the frame member and signalling means including a noise emitting





element attachable to each of the respective projectile matrices, whereby deflection upon projectile impact with either matrix will result in contact between said elements to effect an audible response.

4,141,550

TENNIS SERVE TRAINING DEVICE

Nejat H. Denizman, 676 W. Diversey Ave., Chicago, Ill. 60614

Filed Sep. 12, 1977, Ser. No. 832,585
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A **16 Claims**

1. A practicing device for use in developing and maintaining an accurate tennis serve ball toss, said device comprising:

a carrier defining a downwardly open space;

means for supporting the carrier with said space disposed at a position corresponding to the top of the path of a tennis ball properly tossed by the user in a simulated serving action;

a flexible element extending fully transversely across and below said space and being arranged to be urged upwardly into said space by a tennis ball tossed upwardly thereto; and

signalling means for providing a signal in the event a tennis ball is tossed incorrectly (a) upwardly through said space sufficiently to carry said flexible element therewith upwardly through said space to cause a sudden movement of the carrier, or (b) laterally adjacent said space to impact against said carrier to cause a sudden movement of the carrier.

4,141,551

RACKET

Gunnar P. M. Göransson, Folkungagatan 136, S-116 30 Stockholm, Sweden

Filed Apr. 1, 1977, Ser. No. 783,599
Claims priority, application Sweden, Apr. 9, 1976, 7660418
Int. Cl.[2] A63B *51/00*
U.S. Cl. 273—73 G **9 Claims**

1. In a game racket including a racket head comprising an open, substantially oval frame member, a first set of strings strung to the frame member and running substantially in the longitudinal direction of the racket head, and a second set of strings strung to the frame member and running substantially in the transverse direction of the racket head across the longitudinal strings, the improvement characterized by:

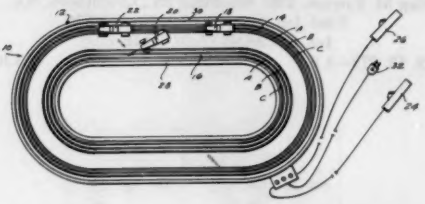
means embodied in the frame member for mounting one end of each of a plurality of adjacent ones of the longitudinal strings of the first set in a center portion of the racket head in such a manner that they have free and laterally unrestrained active lengths which successively increase the farther away they are displaced from the longitudinal center line of the racket head, said mounting means having a plurality of spaced through bores for receiving said plurality of adjacent longitudinal strings, the diameter of said bores being sufficiently larger than the diameter of said strings to permit the strings to run substantially unobstructedly therethrough, whereby such successively increasing active lengths compensate for the decreasing active lengths of the transverse strings as they approach the handle end of the racket head, thereby providing an enlarged sweet spot.

4,141,552

TOY DRONE CAR GAME

Edwin A. Nielsen, Oceanside, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Continuation-in-part of Ser. No. 747,442, Dec. 6, 1976, Pat. No. 4,078,798. This application Aug. 15, 1977, Ser. No. 824,668
Int. Cl.[2] A63F *9/14*; A63H *18/12*
U.S. Cl. 273—86 B **9 Claims**



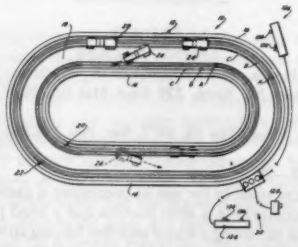
1. A toy vehicle game comprising a guide track defining a pair of lanes along which two vehicles may move in side by side relation, means in said track in each of said lanes for separately supplying varying current flow of reversible polarity to at least two separate vehicles on said track, said means including a pair of laterally spaced current supply contact strips and a ground strip in each of said track lanes with the strips being in the same relative position in each lane, each of said current supply strips being electrically connected to a corresponding strip in the other lane, operator operable control means connected to said current supply strips for enabling the operator to separately supply current of reversible polarity and varying value thereto, and a drone vehicle for use on said track including a body, means for driving said body along said track including an electric motor, means in said drone vehicle respectively associated with the current supply strips and ground strip in a track lane for simultaneously collecting current from said current supply strips and means connected between said respective current collecting means and said motor for continuously supplying current of only a predetermined polarity to said motor from said strips in the track regardless of the polarity of current in the current supply strips.

4,141,553

TOY VEHICLE GAME

Janos Beny, Redondo Beach; James D. Moore, Rancho Palos Verdes, and John W. Ryan, Los Angeles, all of Calif., assignors to Ideal Toy Corporation, Hollis, N.Y.

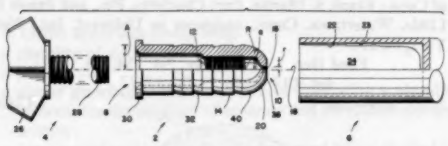
Division of Ser. No. 783,833, Apr. 1, 1977, Pat. No. 4,079,938, which is a division of Ser. No. 747,441, Dec. 6, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,739
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 B **8 Claims**



1. A toy vehicle game including a plurality of toy vehicles and a guide track having a pair of upstanding laterally spaced side walls spaced from each other a distance sufficient to define at least two vehicle lanes enabling two vehicles to move along

the track in side by side relation; said plurality of toy vehicles including at least one non-steerable drone vehicle, means for driving the drone vehicle along the track at a predetermined relatively constant speed, the other of said toy vehicles each including a pair of laterally spaced selectively driven combination steering and drive wheels rotatably mounted on said frame for rotation in fixed vertical planes, a reversible rotary drive motor in said frame including a rotary power output member, means operatively engaged with said output member of the drive motor for selectively driving one or the other of said combination steering and drive wheels in the forward direction of travel in response to the direction of rotation of said drive motor whereby said other vehicles will move from one lane to the other in the forward direction and be guided along one or the other of said side walls depending on which drive wheel thereof is being driven; and means for selectively varying the speed of movement of said other vehicles thereby to permit said other vehicles to pull out and pass said one vehicle.

4,141,554
ARROW SHAFT SOCKET
Donald D. Sherwin, 701 Madison St., Port Richey, Fla. 33568
Filed Feb. 3, 1977, Ser. No. 765,156
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 R **15 Claims**



1. An improved arrow shaft socket for mounting an end portion of the arrow thereto, comprising:

a substantially cylindrical, hollow tube with an open end and a substantially closed end, having an inner, cylindrical, threaded surface of an inner radius and an outer, cylindrical surface of an outer radius;

said closed end of said tube having a small, substantially circular hole therethrough, substantially coaxial with said inner cylindrical surface, having a radius substantially smaller than said inner radius;

said closed end of said tube having an external surface substantially hemispherical in shape, with a radius substantially the same as said external radius;

whereby said tube may be more easily inserted into an adhesive coated, axial hole in one end of an arrow shaft, allowing entrapped air to pass through said small hole without the adhesive flowing onto said threaded surface.

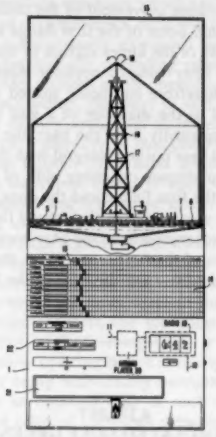
4,141,555
GAME WITH MINIATURE OIL WELL RIG IN A TRANSPARENT DOME
Ivan E. Dean, 804 Penn Dr., Friendswood, Tex. 77546
Filed Dec. 2, 1977, Ser. No. 856,621
Int. Cl.[2] A63B *71/00*; A63H *33/00*
U.S. Cl. 273—139 **3 Claims**

1. A game, comprising

a housing having an oil reservoir therein, a source of electrical energy therein, an electric motor therein, a pump therein operated by the motor for pumping oil, oil return slots in the top thereof for returning oil pumped out of the housing back into the oil reservoir and an electric circuit connecting the electric motor to the source of electrical energy via a plurality of adjustably positionable electric contacts;

a transparent dome mounted on the housing and extending from the top thereof; and

a miniature oil drilling rig mounted on the top of the housing in the dome, said rig having a tube extending into the housing via the top thereof and into the oil reservoir therein whereby when the electrical contacts are moved into electrical contact with each other the motor is energized by the source of electrical energy to operate the pump to continuously pump oil up through the pipe and out at the top of the rig, the oil returning to the oil reservoir via the dome and oil return slots.



4,141,556
GOLF PUTTER
Leo J. Paulin, 7315 Wisconsin Ave., Bethesda, Md. 20014
Filed Feb. 16, 1977, Ser. No. 769,114
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—164 **1 Claim**

1. A golf club for use as a putter, comprising a head and a straight shaft, the head comprising a generally flat base which is shaped as an equilateral triangle with two outwardly curved side edges, a first flange connected to the base at the third edge thereof and extending upwardly therefrom and having a flat uninterrupted substantially vertical exterior surface forming a striking face the length of which is substantially equal to the diameter of a golf ball, a second flange extending upwardly from the base at substantially a right angle thereto and at its one end intersecting the midpoint of the first flange at a right angle and at its other end terminating at the apex of the base which is opposite the first flange, the base of the head having a lower surface which is downward convex both in the direction of striking movement of the club and transversely thereto

and has a smaller radius at and adjacent each of the edges than at and adjacent its center, and three fore-and-aft extending lines on the upper surface of the first flange and extending in the direction of striking movement of the club, one line being at the transverse mid-point of the first flange and also extending along the length of the upper surface of the second flange, and the other two lines being on opposite sides of the one line and equi-distant therefrom and being spaced apart a distance substantially equal to the diameter of a golf ball, a two part hostle extending upwardly from the base, the hostle comprising a solid, vertical base portion integral with the second flange and extending equi-distant on either side of the flange and equi-distant from the first flange and the apex of the base and terminating at the upper edge of the second flange and a shaft receiving portion extending from the base portion and inclined to the base portion of the hostle to receive the shaft which is angularly disposed relative to the base of the head.

4,141,557

SIMULATED GOLF GREEN

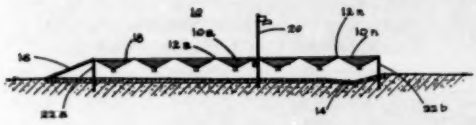
Samuel E. Ingwersen, 529 E. Town St., Columbus, Ohio 43215

Continuation-in-part of Ser. No. 544,304, Jan. 27, 1975, Pat. No. 3,990,708. This application Sep. 27, 1976, Ser. No. 727,361

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—181 A **2 Claims**



1. A simulated golf green including means for supporting same above ground level, and including a simulated apron, comprising a plurality of contiguous open segment areas defined by a first plurality of horizontal parallel strands of wire intersected by a second plurality of horizontal parallel strands of wire, there lying below each open segment area a downwardly tapering enclosure of netting terminating in a ring structure adapted to transfer a spent projectile therethrough and to indicate at a removed location the passage of said projectile therethrough, each segmented area being indicative of a given distance or location with reference to a flag stick positioned in said simulated golf green.

4,141,558

GOLF BALL STORING, DISPENSING AND TEEING APPARATUS

James K. Hoffman, 8841 Independence Ave., Canoga Park, Calif. 91304

Filed Jan. 30, 1978, Ser. No. 873,362

Int. Cl.[2] A63B *57/00*

U.S. Cl. 273—201 **21 Claims**

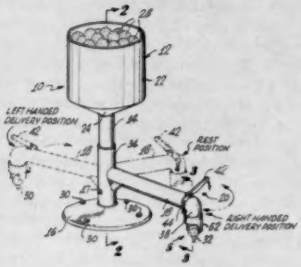
1. A dispensing and teeing apparatus for golf balls comprising:

a canister for storing a plurality of golf balls to be dispensed;

a supply member for said golf balls extending downwardly from said canister and in communication with the interior thereof to receive said stored golf balls therefrom;

a delivery member connected to said supply member; and

releasing means carried by said delivery member to release said golf balls sequentially therefrom onto a tee;



said delivery member being pivotable about a vertical axis to move away from said tee after one of said golf balls has been released.

4,141,559

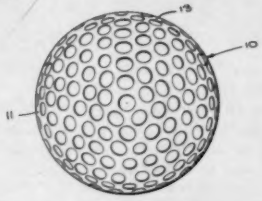
TWO-PIECE SOLID GOLF BALL

Terence Melvin, Southbury; Joseph K. Pieroni, Newtown, both of Conn.; Frank S. Martin, Port Charlotte, Fla., and James F. Little, Watertown, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,715

Int. Cl.[2] A63B *37/00, 37/12*

U.S. Cl. 273—220 **1 Claim**

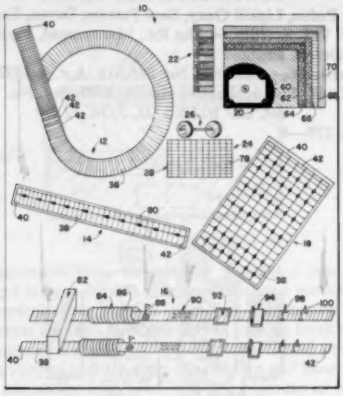


1. A solid two-piece molded golf ball having a spherical core having a diameter of 1.505 inches, a PGA compression of 65, a rebound of at least 75% and a specific gravity of 1.20, the said core comprising a cross-linked composition containing 100 parts by weight of polybutadiene elastomer having a cis-1,4-polybutadiene content of 50% by weight or more and from 10 to 60 parts by weight of preformed zinc oxide-methacrylic acid reaction product in which the zinc oxide and methacrylic acid are combined in the proportions required by basic zinc methacrylate, said preformed reaction product being finely ground to a fineness such that at least 99% passes a 325 mesh sieve, said core composition containing a free radical generating curing agent in amount sufficient to cure the composition, the said core being surrounded by a cover composition of sufficient thickness to provide a ball diameter of 1.680 inches, said cover composition comprising an ionomer resin which is a thermoplastic, resinous ionic copolymer of an olefin having from 2 to 8 carbon atoms and a metal salt of an unsaturated monocarboxylic acid containing from 2 to 8 carbon atoms, the outer surface of the said cover being painted and having a dimple pattern consisting of essentially 252 dimples circular in cross-section, the dimensions of the dimples expressed as mold dimensions being 0.160 inch in diameter by 0.0145 inch deep, said dimples being arranged in an icosohedral array uniformly distributed on the surface of the ball and covering approximately fifty percent of the area of the ball surface, the molded ball having been deflashed by centerless grinding, whereby the ball exhibits improved flight characteristics.

4,141,560
BOARD GAME APPARATUS

Richard Kaslow, Box 165, Hill City, Minn. 55748

Filed Sep. 8, 1976, Ser. No. 721,357
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—244 9 Claims

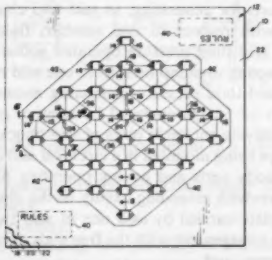


9. Game apparatus comprising:
a plurality of gamepieces;
a pair of dice
a planar gameboard including indicia simulating a plurality of areas for the conduct of separate and unrelated sporting events;
at least one of said areas on said gameboard being divided by indicia into a course having substantially rectangular spaces for receiving thereon said gamepieces for movement along said spaces from a starting line to a finish line in accordance with the dice reading appearing on a throw;
another of said areas including indicia for simulating a weight lifting match; and
a chart on said gameboard having a column of possible dice readings, each reading having associated therewith a row of entries, the entries representing an increasing succession of weights, each entry being yes or no.

4,141,561
GAME CARD ASSEMBLY

Erich A. Spitzner, Niles, Ill., assignor to Regal Games Mfg. Co., Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,751
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—271 1 Claim



1. A game card assembly for use in connection with a game such as tic-tac-toe, said assembly comprising a laminated game board including a bottom backing sheet, a top sheet, and an intermediate guide sheet, adjacent sheets being adhesively secured together in face-to-face relationship in order to provide a three-ply laminated game board, said top sheet being formed with a plurality of elongated window openings which are quadrilaterally arranged substantially in checkerboard fashion so as to provide windows which are disposed in vertical, horizontal and diagonal rows, each window opening being in the form of a horizontally elongated hexagonal opening having parallel horizontally extending edges, together with V-shaped notch-like recesses at the opposite ends of the opening, each window opening, exclusive of said recesses, defining a square medial display area, said intermediate guide sheet being formed with a plurality of elongated guide slots, there being one slot in register with each window opening, the longitudinal and transverse extent of each slot being greater than the longitudinal and transverse extent of its respective window opening so that the peripheral regions of the slot are overlapped by the edge regions of the window opening, and a pair of substantially flat differently colored rectangular shutters slidably disposed in each slot and normally assuming spaced apart retracted positions wherein the major end portions thereof project beneath the top sheet and so that the medial display area of the backing sheet is visually exposed through the window opening between the spaced apart shutters, each shutter being individually movable to an advanced position wherein an opposed edge of such shutter meets the adjacent opposed edge of the other retracted shutter with a major portion of the moved shutter extending across and covering and thus concealing the display area of the associated window opening and rendering a visible color indication of its presence in such advanced position, and a finger catch in the form of a small protuberance projecting upwardly from the top surface of each shutter in the vicinity of its meeting edge, the ends of said guide slots in the intermediate guide sheet constituting limit stops for the adjacent ends of the shutters so that when the shutters are in their retracted positions the finger catches thereon are maintained free from the edges of the notch-like recesses at the ends of the window openings, thus inhibiting wear between the protuberances and such recesses and affording fingernail access to the protuberances during continued use of the game card assembly, said quadrilaterally arranged window openings being thirty-four in number and the checkerboard arrangement thereof involving seven vertical rows of window openings embodying containments of two, five, six, eight, six, five and two in the various vertical rows reading horizontally in either direction, and eight horizontal rows of window openings embodying containments of one, four, five, seven, four, five and one in the various horizontal rows, reading vertically in either direction.

4,141,562
METHOD OF ENHANCING THE PERFORMANCE OF LIP-TYPE SHAFT SEALS

David H. Wu, Warren, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Division of Ser. No. 442,725, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 313,712, Dec. 11, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 538,671
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—1 12 Claims

1. A method for sealing the space between a shaft and a bore of a housing through which the shaft extends, the housing being under high internal fluid pressure, the method comprising providing in the space between the shaft and bore, a lip-type seal body having an axially inwardly extending, shaft-engaging sealing lip, a first portion extending from the sealing lip axially outwardly, and a second portion extending thence radially outwardly and axially inwardly providing a generally toroidal space facing inwardly toward the internal fluid pressure, said first portion having a radially inner surface the diameter of which is greater than the inner diameter of said lip such that said inner surface is spaced from and out of contact with said shaft and preventing deterioration of said first portion by its being forced radially inwardly down upon said shaft by the fluid pressure, by substantially filling said toroidal space with a

ring of elastomeric material in contact with said fluid pressure, and bonding said ring to the entire surface of said body in contact with said ring, said filling and bonding steps including

the steps of holding said first portion up off of said shaft, preventing said fluid from getting between said ring and said first portion, and allowing said first portion to retain its flexibility without any substantial interference from said ring.

4,141,563

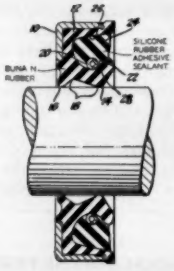
POWER TRANSMISSION

David H. Wu, Warren, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Continuation of Ser. No. 442,725, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 313,712, Dec. 11, 1972, abandoned. This application Dec. 31, 1975, Ser. No. 645,668

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—152 **14 Claims**



1. Apparatus comprising in combination a housing having a housing bore therethrough, a shaft extending through said housing bore, and a shaft seal mounted on said housing bore for sealing the space between said shaft and said housing bore said seal comprising a body having a shaft engaging lip in contact with said shaft, the body including a first flexible portion extending from the lip axially outwardly, and a second portion extending thence radially outwardly and axially inwardly to provide between said first and second portions a generally toroidal space, said first portion having a radially inner surface the diameter of which is greater than the inner diameter of said lip such that said inner surface is spaced from and out of contact with said shaft, and a ring of elastomeric material contained in said toroidal space and bonded to the entire surface of said body in contact with said ring, said ring of elastomeric material being in that physical condition such that it does not force said first portion radially inwardly down upon said shaft, and such that said ring exerts a radially outwardly directed holding force on said first portion resisting said inner surface of said first portion from being forced radially inwardly down onto said shaft, when said seal is being used in a high pressure application, and such that said ring does not interfere substantially with the flexibility of said first portion.

4,141,564

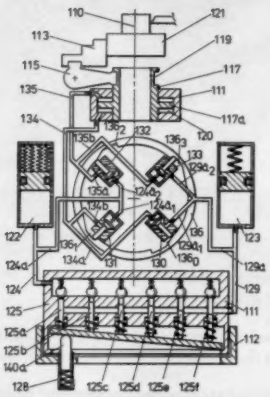
POWER OPERATED CHUCK

John R. Peden, Liphill Quay, Bere Ferrers, Devon, England, and Derek V. I. Santillo, 66 Elm Rd., Mannamead, Plymouth PL4 7BB Devon, England

Continuation-in-part of Ser. No. 565,318, Apr. 4, 1975, Pat. No. 4,032,161. This application Apr. 6, 1977, Ser. No. 785,148

Int. Cl.[2] B23B *5/22, 5/34, 31/30*

U.S. Cl. 279—4 **10 Claims**



1. In a power operated work holding chuck of the type having:

a chuck body,

radially movable jaws on the chuck body,

fluid pressure operated actuator means,

means linking said pressure operated actuator means to said jaws on said chuck body, whereby to transmit movement of said pressure operated actuator means to said jaws,

the improvement wherein:

said chuck body is formed in two parts which are secured together and rotatable with respect to one another, one of said chuck body parts housing said fluid pressure operated actuator means,

means for mounting said one of said chuck body parts on a spindle of a machine tool,

means defining fluid pressure reservoirs in said one of said two chuck body parts,

a power source comprising means within said two chuck body parts for generating, as said two chuck body parts rotate with respect to one another, fluid pressure for driving said fluid pressure operated actuator means, said source acting to pump fluid from one said reservoir to the other, said fluid pressure generating means comprising a plurality of pumps operated by relative rotation of said two relatively rotatable parts of said chuck, said plurality of pumps being mounted in a circle on said one of said two chuck body parts and having operating plungers associated therewith extending axially of the chuck body,

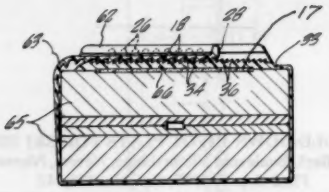
a swash plate carried by said one of said two chuck body parts in engagement with the free ends of said plungers of said pumps, and

resilient biasing means on said other of said two chuck body parts, in engagement with said swash plate and resiliently biasing it to a position inclined with respect to the plane defined by the free ends of said plungers of said pumps when they are not depressed.

4,141,565
ADJUSTABLE SKI STRAP

Michael P. Shields, 3956 Deer Ave., Sherman Oaks, Calif. 91423

Continuation-in-part of Ser. No. 667,121, Mar. 15, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,820
Int. Cl.[2] A63C *11/02*
U.S. Cl. 280—11.37 A 14 Claims

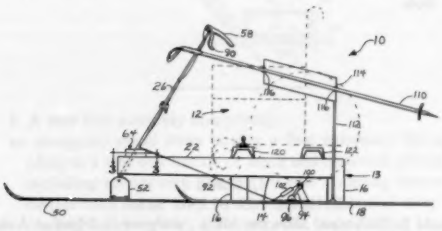


1. An adjustable strap for holding together a pair of skis comprising a tongue portion, a tongue receiving portion and a foldable central strap portion extending therebetween, said tongue portion having a first plurality of locking teeth thereon and said tongue receiving portion including a base portion, a second plurality of locking teeth disposed on said base portion and being adapted to mate with said first plurality of teeth on said tongue portion and a pair of tongue retaining walls hingedly connected to said base portion and extending over and bearing against a portion of said tongue portion for holding said first and second pluralities of teeth in a mated relationship within said tongue receiving portion, said walls, upon disengaging said teeth and folding said central strap portion within said tongue receiving portion, extending over and bearing against a portion of said tongue portion for holding said central strap portion and said tongue portion within said tongue receiving portion.

4,141,566
WHEELCHAIR SUPPORTING SLED

David M. Benes, 5108 Wildwood, Wixom, Mich. 48096; Allan L. Gates, 408 S. Kinney, Mt. Pleasant, Mich. 48858, and Richard Ryan, Stanwood, Mich., assignors to David M. Benes, Wixom and Allan L. Gates, Mt. Pleasant, both of, Mich.

Filed May 11, 1977, Ser. No. 795,704
Int. Cl.[2] B62B *13/04*
U.S. Cl. 280—16 4 Claims



1. A sled for the releasable attachment of a wheelchair, said sled comprising:

a pair of longitudinally spaced, horizontally disposed support members;

a pair of ski runners;

frame means consisting of a plurality of transverse channel members secured to said support members forming a rectangular portion at the midsection of said sled, said ski runners being fixedly attached to said support members such that the upper surfaces of said support members are elevated above said ski runners, said support members being spaced apart and of such a length as to be received laterally between the wheels of a conventional wheelchair so as to support said wheelchair on said sled and said wheelchair wheels being elevated above said ski runners;

securing means carried by the upper surface of said support member for lockingly engaging said wheelchair frame to secure said wheelchair to said sled;

a steering runner;

a steering post pivotally connected by said frame means for attaching said steering runner to said sled, said steering post having a steering wheel, said post extending above said frame means a sufficient distance to permit the occupant of said wheelchair to manipulate and steer said sled;

a pair of outriggers extending laterally from said ski runners for providing lateral flexible support to said sled for preventing said sled from tilting sideways beyond a predetermined amount, said flexible support comprising a multiplicity of flexible lateral planer members affixed at one end to said support members and at the other end to said outriggers; and

a wheelchair fixedly and detachably attached to said support members.

4,141,567
HANDLE BAR HAND GUARDS

Gary M. Scott, 17385 Colina Vista, Milwaukie, Oreg. 97222

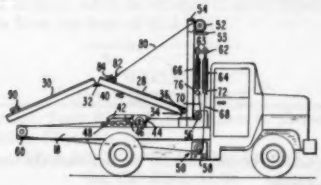
Filed Jan. 31, 1977, Ser. No. 764,191
Int. Cl.[2] B62J *23/00*
U.S. Cl. 280—289 G 6 Claims

1. A rigid plastic cover, referred to as a hand-guard, which is adapted to encircle the front 180° of the hand of the operator of a handlebar-controlled vehicle, mounted securely by fastening devices to a handlebar mounted lever clamp just inboard of the operator's hand, and to an expanding fastener that is plugged directly into the end of the handlebar just outboard of the operator's hand.

4,141,568
CONVERTIBLE FLATBED TRUCK

Frank R. Donnelly, 18 Burton La., Rockaway, N.J. 07866

Continuation-in-part of Ser. No. 772,261, Jan. 25, 1977, Pat. No. 4,078,818. This application Mar. 13, 1978, Ser. No. 886,062
Int. Cl.[2] B60P *3/42*
U.S. Cl. 280—415 B 8 Claims



1. A convertible vehicle comprising a wheel supported tractor capable of interconnection with a flatbed unit, a fifth wheel coupler formed with a slot and mounted on said tractor, a pin mounted on said flatbed unit, such that said pin can be received in said slot for connecting and disconnecting said flatbed unit from said coupler, said flatbed unit including a forward slab and a rear slab, first coupling means connecting

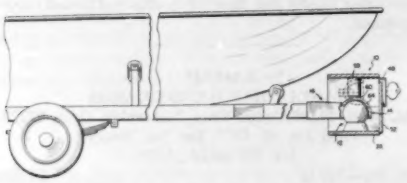
said forward slab and rear slab for folding movement, second coupling means connecting said flatbed unit to said tractor, means on said tractor for connection with said flatbed unit, and said fifth wheel coupler such that when said fifth wheel coupler is connected with said means, said fifth wheel coupler is capable of movement into and out of engagement with said pin, and when said flatbed unit is connected to said means after disengagement of said fifth wheel unit, said forward and rear slabs are capable of being folded together and pivoted into a stored position on said tractor whereby said vehicle can be converted into either a flatbed truck or a semi-trailer truck.

4,141,569

THEFT PREVENTION DEVICE

Larry W. Dilk, 2916 W. Sardonyx St., Indianapolis, Ind. 46268

Filed Aug. 10, 1977, Ser. No. 823,408
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—507 **11 Claims**



1. A theft prevention device for a vehicle having a towing coupler including a coupler cavity adapted to receive a towing post, the theft prevention device comprising a post sized to be received in the cavity, a frame supporting the post, the frame including a cover, means for movably attaching the cover to the body of the frame, the frame further including a side facing the cover, and three intermediate sides extending between the cover and the side facing the cover when the device is in the closed position to surround and effectively to shelter the coupler against tampering, the cover, the side opposite the cover, and the three intermediate sides cooperating to define on the frame one open side to permit the coupler to project into the frame for engagement by the post when the device is in the closed position, the post being located on one of the cover and the side facing the cover so that when the cover is in the open position, the post can be inserted into the coupler cavity, and when the cover is in the closed position, the post cannot be removed from the coupler cavity, and means for locking the cover in the closed position.

4,141,570

ADJUSTABLE CONNECTION BETWEEN SKI AND BINDING

James L. Sudmeier, 1456 Everton Pl., Riverside, Calif. 92507

Filed Oct. 17, 1977, Ser. No. 842,728
Int. Cl.[2] A63C *9/00*
U.S. Cl. 280—607 **6 Claims**

1. An adjustable connection for use between ski bindings and a ski, comprising:

an elevated platform adapted to be mounted on the ski;

a boot plate to which the ski bindings are attached, said boot plate being mounted on top of said platform and being angularly adjustable with respect thereto in a substantially horizontal plane to compensate for toe-in or toe-out angularity of the foot and thereby position the skis parallel to one another despite the angularity of the skier's feet;

said boot plate being also adjustable longitudinally with respect to the length of the ski by sliding the boot plate forwardly or rearwardly on said platform so as to position the skier's weight at the optimum location along the length of the skis for the type of skiing being done or for conditions of the ski slope; and

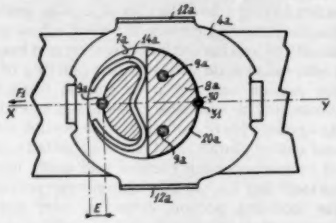
means for securing said boot plate in adjusted position.

4,141,571

HEEL HOLD-DOWN PIVOT PLATE FOR SKI BINDING

Jean J. A. Beyl, Boulevard Victor-Hugo, Nevers, Nievre, France

Filed Sep. 7, 1977, Ser. No. 831,242
Claims priority, application France, Sep. 28, 1976, 76 29075
Int. Cl.[2] A63C *9/00*
U.S. Cl. 280—620 **3 Claims**



1. A device for fixing the heel of a ski boot to a ski, comprising

a mounting member rigidly attached to said ski,

a plate adapted to be engaged by the heel of said boot, said plate having an aperture for rotatably and slidably positioning said plate on said mounting member,

spring means on said mounting member urging said plate toward the front of the ski, while permitting rearward displacement thereof,

and detent means intermediate one side of said aperture and said mounting member for releasably positioning said plate on said mounting member in a desired angular position.

4,141,572

VEHICLE LEVELING STRUT

Ronald L. Sorensen, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jul. 18, 1977, Ser. No. 816,454
Int. Cl.[2] B60G *17/00*
U.S. Cl. 280—707 **34 Claims**

1. A telescopically adjustable assembly,

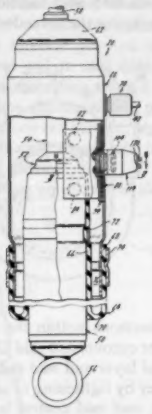
including a first member defining a chamber,

a second member telescopically movable within said chamber,

a source of pressurized fluid for moving said members relative to one another,

a control circuit including position sensing means for effecting actuation of said source in response to relative displacement of said members, and

means for supporting said position sensing means on an interior wall portion of said chamber and for orienting



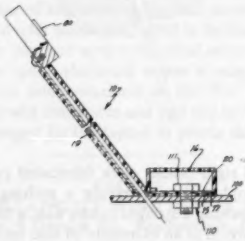
said sensing means at a predetermined location relative to one of said members.

4,141,573

SEAT BELT ASSEMBLY CONNECTION AND METHOD FOR FABRICATING

Gordon A. Ellens, Grand Rapids, Mich., assignor to U.S. Industries, Inc., Grand Rapids, Mich.

Filed Oct. 19, 1976, Ser. No. 733,757
Int. Cl.[2] B60R *26/10*
U.S. Cl. 280—744 **2 Claims**



1. A seat belt assembly comprising:

an elongated metal strap having a first extremity for coupling to a seat belt buckle or latch and a second extremity including an opening adapted to pass coupling means to couple said metal strap to a vehicle, said metal strap including an elongated, generally flat body having an angled, integral end flange with said opening; and

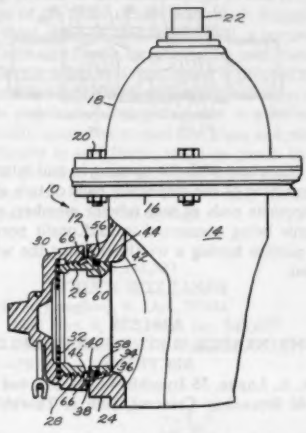
coating means covering and adhering to said body having a connected integral flap including a cupped, concave recess opening toward said end flange, said flap being moveable to expose said opening for passing said coupling means and to cover said opening and said coupling means when said metal strap is secured to the vehicle, and having an inwardly extending peripheral edge flange around the perimeter of said concave recess for engaging the periphery of said angled, integral end flange of said metal strap and securing said flap to said end flange, thereby substantially immobilizing said flap with respect to said end flange and covering said opening and said coupling means.

4,141,574

MEANS FOR LOCKING THREADED NOZZLES TO A FIRE HYDRANT

Dennis N. Stansifer, Decatur, and Ralph W. Henderson, Maroa, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Aug. 8, 1977, Ser. No. 822,996
Int. Cl.[2] E03B *9/06*; F16B *3/00, 39/02, 41/00*
U.S. Cl. 285—92 **6 Claims**



1. In a fire hydrant comprising a barrel having a bore therethrough terminating at its outer end portion in a counterbore having a peripheral wall and an outwardly facing radial wall, said bore having interior threads on its inner portion terminating short of said counterbore; a replaceable nozzle having an outwardly and radially extending flange intermediate its outer and inner end portions and arranged to be threadedly received in said counterbore, said flange having at least a portion of its peripheral surface spaced radially inwardly a predetermined distance from the peripheral wall of said counterbore, said nozzle having exterior threads on its inner end portion for receiving the interior threads of said boss; and means engaging said peripheral wall of the counterbore of said barrel and said portion of the peripheral surface of flange of said replaceable nozzle for locking said replaceable nozzle to said barrel;

the improvement in locking means comprising an elongated rod member of circular cross-section and having a continuous thread of predetermined pitch thereon defining teeth extending generally transverse of a longitudinal axis of said rod member, said rod member positioned between said peripheral wall of said counterbore and said at least a portion of the peripheral surface of said flange with its teeth engaging the same and its longitudinal axis curved coaxially about an axis of said counterbore whereby each of said teeth on said rod member is simultaneously subjected to shear when an attempt is made to unthread said nozzle from the bore of said barrel.

4,141,575

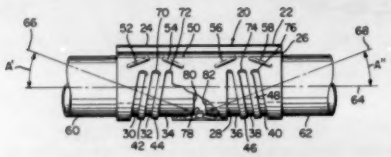
COUPLING SLEEVE

Remo Mariani, Toms River, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jul. 27, 1977, Ser. No. 819,548
Int. Cl.[2] F16L *37/08*
U.S. Cl. 285—305 **7 Claims**

1. A coupling sleeve comprising: an elongate hollow tubular member having a first end portion, a second end portion, and a central portion intermediate said first and said second end portions, the wall of each of said first and said second end portions being partially slit in at least two longitudinally spaced locations along respective substantially parallel planes intersecting the central axis of said tubular member at an

oblique angle thereto to provide at least one obliquely oriented deflectable ring element offset from the opening in said tubular member and depending respectively from the unslit portion of said wall of each of said first and said second end portions, said ring elements being initially tilted in opposite directions away from said central portion of said tubular member and being



urged into alignment with the opening in said tubular member upon the insertion of the respective ends of two elongate elements at opposite ends of said tubular member, each of said ring elements being connected to said unslit portion of said wall by a portion having a width less than the width of said ring element.

4,141,576

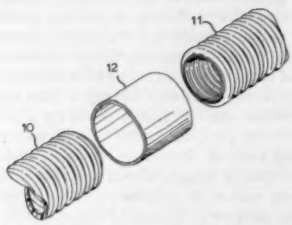
HEAT SHRINKABLE SLEEVE FOR COUPLING PIPE SECTIONS

Manfred A. A. Lupke, 35 Ironshield Crescent, and Gerd P. H. Lupke, 46 Stornoway Crescent, both of Thornhill, Ontario, Canada

Continuation-in-part of Ser. No. 827,431, Aug. 23, 1977, abandoned. This application Dec. 30, 1977, Ser. No. 866,028

Int. Cl.[2] F16L *47/00*

U.S. Cl. 285—369 **9 Claims**



1. A pipe joint comprising a pair of corrugated pipe sections aligned end to end, said pipe sections having respective adjacent end portions located within an auxiliary sleeve of relatively hard thermoplastic material adapted to resist shearing forces tending to misalign the end portions of the pipe sections, a sealing ring located within the auxiliary sleeve and positioned to provide a seal at the join between the ends of the pipe sections, and an outer heat shrinkable sleeve shrunk into frictional engagement with said end portions and conforming to the corrugations of said end portions and interlocking therewith, the auxiliary sleeve and sealing ring being clamped between the outer sleeve and said end portions.

4,141,577

SADDLE CLAMP AND METHOD OF MANUFACTURE

J. Ted Beebe, 22511 Sunnydale, St. Clair Shores, Mich. 48081

Filed Sep. 14, 1977, Ser. No. 833,164

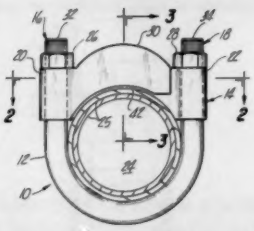
Int. Cl.[2] F16L *13/14*

U.S. Cl. 285—382.2 **6 Claims**

1. A saddle clamp assembly comrising:

a saddle member including three sheet layers stacked together with a pair of saddle eyes formed at either end of said stacked layers, each of said layers being contoured along one edge thereof in an arcuate radiused cutout with the central layer cutout being formed with a radius slightly smaller than the outer two layer cutouts, each of the cutouts being concentrically aligned whereby a protruding ridge comprised of the central layer cutout is provided;

a U-bolt received into said saddle eyes formed and nuts threadably engaging the threaded ends of said U-bolt;



whereby, pipe sections within the opening defined by the saddle member cutouts and said U-bolt can be compressed by said central layer and said saddle member and by said U-bolt member by tightening of said nuts with said U-bolt member ends, and said central layer provides a pressure ridge for crimping of said clamped pipe sections.

4,141,578

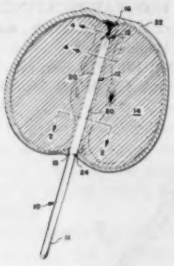
HOLDER STICK FOR A CONFECTIONARY PRODUCT

Victor Zindcr, 301 Westham Pkwy., Richmond, Va. 23229

Filed Nov. 21, 1977, Ser. No. 853,378

Int. Cl.[2] A23P *1/00*

U.S. Cl. 294—61 **10 Claims**



1. An integral rigid holder stick fabricated of an injection moldable thermoplastic resin having a melting point above 250° F. and comprising a straight center axis, a handle portion, a tapered end portion at an extremity of said stick, and a gripping portion disposed between said handle portion and said tapered end portion, said handle portion having the configuration of essentially a right circular cylindric surface coaxially disposed with respect to said center axis, said gripping portion having the configuration of a non-circular right cylindric or prismatic surface or combinations thereof having four straight edges parallel to said center axis and equi-angularly and equidistantly spaced therefrom, the terminus of said tapered end portion being a curved edge coplanar with said center axis and formed by the intersection of two curved surfaces at an angle between about 30° and 130°.

4,141,579

LITTER RETRIEVING DEVICE

Thomas Moss, P.O. Box 11792, Houston, Tex. 77039

Filed Nov. 29, 1977, Ser. No. 855,806

Int. Cl.[2] B08B *1/00*

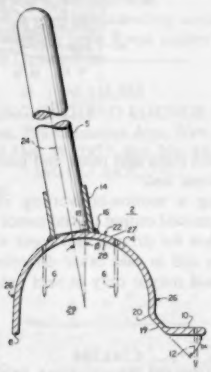
U.S. Cl. 294—61 **6 Claims**

1. A litter retrieving device for retrieving both containers and flat articles comprising:

(a) a handle means in the form of an elongate rod having a longitudinal axis;

(b) a semi-cylindrical means, said semi-cylindrical means having an outer convex surface and an inner concave surface defining an interior portion, said elongate rod being attached at one end to said outer convex surface, said longitudinal axis extending along a radial line of said semi-cylindrical means approximately perpendicular to a tangent to said outer convex surface, an extension of said longitudinal axis passing through said interior portion of said semi-cylindrical means;

(c) a flanged lip formed as an extension along a side of said semi-cylindrical means;



(d) first piercing means located on the inner concave surface of said semi-cylindrical means;

(e) second piercing means located on said flanged lip, and first and second piercing means all lying in parallel planes; and

(f) a transitional inlet means located between said flanged lip and an edge of said semi-cylindrical means, wherein said transitional inlet means is adapted to facilitate entry of said containers into said semi-cylindrical means;

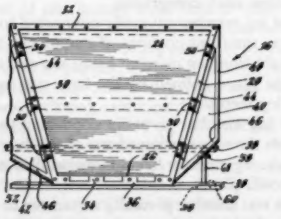
wherein said semi-cylindrical means is adapted to encircle and restrain said containers as the first piercing means penetrates said containers and said second piercing means on said flanged lip is adapted to pierce said flat articles.

4,141,580

COLLAPSIBLE WIND DEFLECTOR

Joseph R. Ivan, 9 Garrick Rd., Scarborough, Ontario, Canada (1M1 1S6)

Filed Jul. 7, 1977, Ser. No. 813,620
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **5 Claims**



1. A collapsible wind deflector adapted to be mounted on a motor vehicle comprising:

a substantially flat frame;

means for mounting said frame upon an outer surface of a motor vehicle;

a substantially flat front panel of isosceles trapezoid shape hingedly affixed on a first edge thereof to said frame, said front panel having diverging second and third opposed edges adjacent said first edge; and

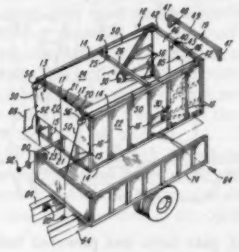
a pair of side panels, a first edge of one of said panels hingedly affixed to said second edge of said front panel, a first edge of the other of said side panels hingedly affixed to said third edge of said front panel, a second edge of each of said side panels for contacting said frame to erect said deflector when said front panel is pivoted away from said frame in a first plane substantially transverse thereto, said side panels each being disposed in a different plane substantially transverse to said first plane and substantially perpendicular to said frame, said side panels being pivotable to a position flush with said front panel, said side panels and said front panel being jointly pivotable adjacent to said frame for flat storage.

4,141,581

TRUCK BOX LINER

Harvey A. Tobin, Langford, S. Dak. 57454

Filed Nov. 4, 1977, Ser. No. 848,607
Int. Cl.² B60P *1/00*; B62D *33/08*
U.S. Cl. 296—39 R **6 Claims**



1. For a truck having a truck frame and a truck box pivotally attached to the truck frame, a liner adapted to be positioned within the truck box including a front section and a pair of side walls, the front section comprising a pair of vertical side frame members, tubular members attached to the vertical side frame members, horizontal bar members slidably positioned within the tubular members, a vertical bar attached to the horizontal bar members, and overlapping panel members attached to the vertical side frame members and to the tubular members.

4,141,582

MULTI-PURPOSE TAIL GATE

Erwin C. Streeter, 1417 Bernardston Rd., Greenfield, Mass. 01301

Filed Mar. 23, 1977, Ser. No. 780,291
Int. Cl.² B60P *1/04*
U.S. Cl. 296—50 **1 Claim**

1. A multi-position tail gate subassembly in combination with a dump-type vehicle pivotally mounting a box having an open rear end with cooperant power means for shifting the box between a normal flat position and a multiplicity of tilted dumping positions relative to the vehicle comprising:

a panel located at the box rear end,

a gate hook fixed to and projecting rearwardly from the box at each side thereof,

powered linkage means at opposite ends of the panel for motivating the panel with respect to the box rear end,

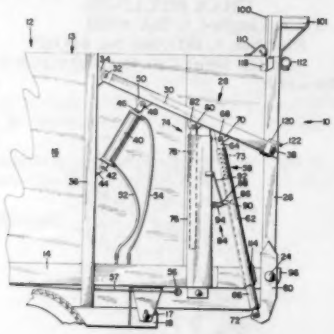
each powered linkage means including a panel lifting arm pivotally connected at its inboard end to a respective side of the box and pivotally and releasably connected at its outboard end to a respective end of the panel,

and a crank lever fixed to a respective end of the panel, and a spring-loaded guide means comprising a tubular member having a connector extending outwardly from one of of its ends and a slide rod which is sleeved by the tubular member and extend outwardly from its opposite end and a compresssion spring disposed within the tubular member between the connector and slide rod, the free end of the connector being pivotally connected to the lifting arm and the free end of the slide rod being pivotally connected to the crank lever for projecting the panel lifting arm upwardly as the crank lever is swung according to and in timed relation with swinging movement of the panel with the gate hooks in interconnected mode with respect to the box rear end and panel,

and a fluid operated cylinder having a piston, the cylinder beng pivotally mounted at the side of the box, and drive means for the cylinder,

with the outermost free end of the cylinder piston being pivotally coupled to the respective panel lifting arm,

slide means for releasably interlocking the panel with each panel lifting arm,



with the panel, gate hook and powered linkage means all adapted and arranged for selectively shifting the panel relative to the box by simultaneous actuation of the cylinders and resultant action of the respective panel lifting arms and spring-loaded guide means between a closed position with the panel closing the open rear end of the box and the slide means in interlocking engagement with the panel lifting arm,

and a plurality of elevated positions with the panel raised and extended rearwardly and upwardly of and spaced from the box and the slide means in interlocking engagement with the panel lifting arm

and an extended bed position with the panel extended horizontally of and rearwardly relative to the box and the slide means out of interlocking engagement with the panel lifting arm

and a ramp position with the panel extended rearwardly of and angularly downwardly relative to the box and the slide means out of interlocking engagement with the panel liftng arm.

4,141,583

ACTUATOR FOR MOTOR-VEHICLE SEAT ADJUSTER

Bernd Klüting, Radevormwald, and Hans W. Voss, Wuppertal, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG., Remscheid-Hasten, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,749

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653680

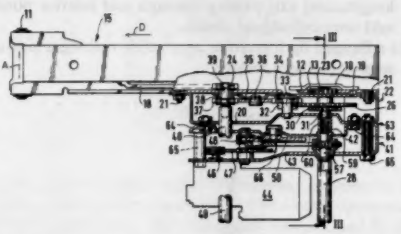
Int. Cl.[2] B60N *1/02*

U.S. Cl. 296—65 R **10 Claims**

1. An actuator for a seat displaceable relative to a fixed support between a pair of end positions, said actuator comprising:

a motor having an output rotatable in a predetermined rotational sense;

means including mechanism having an input rotatable in one direction for displacing said seat on said support from one of said end positions toward the other of said end positions and in the other opposite direction for displacing said seat



on said support from said other end position toward said one end position; and

means including a motion-converting transmission connected between said output of said motor and said input of said mechanism for driving said input alternately in said one direction and in said other direction on continuous rotation of said output only in said predetermined rotational sense.

4,141,584

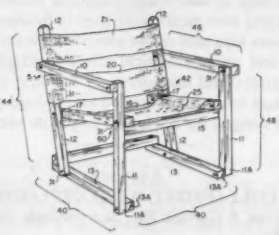
SUPPORTIVE FURNITURE SYSTEM, SUCH AS A CHAIR SYSTEM, AND METHOD OF MANUFACTURE

Victor J. Cook, Jr., 613 Dumaine St., New Orleans, La. 70116

Filed Dec. 16, 1976, Ser. No. 751,539

Int. Cl.[2] A47C *7/00*

U.S. Cl. 297—41 **5 Claims**



1. An article of supporting furniture, comprising:

a. two base side members and a cross member pivotally connected to each of said base side members to allow pivoting only in the horizontal plane;

b. two sides, each comprising:

1. a front leg member pivotally connected to and extending up from the front portions of one of said base side members, said front leg member being allowed to pivot only in the side plane defined by the base side member and the front leg member;

2. a rear leg member pivotally connected to and extending up from the rear portion of one of said base side members, said rear leg member being likewise allowed to pivot only in the side plane;

3. an arm rest member pivotally connected to the top portion of one of said front legs and an intermediate portion of the corresponding rear leg, said arm rest member being likewise allowed to pivot only in the corresponding side plane and defining with said base side member and said front and rear legs a four-sided polygon;

4. two side seat members pivotally connected to said front and rear leg members beneath said arm rest member, said side set members being likewise allowed to pivot in said side plane and dividing said four sided polygon into two smaller four-sided polygons, the structural rigidity of said side in said side plane deriving from the combined differences in pivotal radii with respect to said connections to said base side member of said front and rear leg members at the connections of said side seat member and said arm rest members;

c. a back seat member pivotally connected to said side seat members, said back member being allowed to pivot only in the seat plane defined by said two side seat members;

d. a front seat member pivotally connected to said side seat members, said front member being likewise allowed to pivot only in the seat plane; and

e. flexible support material extending across any two opposite seat members to form a seat support surface.

4,141,585

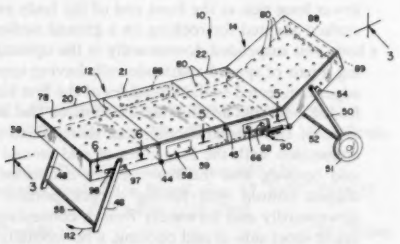
FOLDING COOLING LOUNGE CHAIR

Wynona Blackman, 792 Columbus Ave., New York, N.Y. 10025

Filed Oct. 19, 1977, Ser. No. 843,585

Int. Cl.[2] A47C *7/02*

U.S. Cl. 297—180 **16 Claims**



1. A cooling chair comprising:

A. a seat rest having a first chamber therein,

B. a back rest having a second chamber therein communicating with said first chamber,

C. said chambers each having a closed end and a spaced apart porous end having a plurality of vents and adapted to receive a coolant therein, such as dry ice or the like, for use in cooling the lounge chair,

D. a door mounted relative to one of said chambers to permit the insertion of the coolant therein, said coolant adapted to be supported on said closed end of said chambers,

E. front supporting legs operatively connected to said seat rest,

F. rear supporting legs operatively connected to said back rest,

G. a battery compartment in one of said chambers for storing a battery,

H. access means to said battery compartment so as to permit replacement of said battery from time to time,

I. an electric fan mounted in one of said chambers adjacent a closed end thereof for creating a flow of air through said chambers so as to provide a flow of air over said coolant and exiting from said chamber through said vents,

J. guard means enclosing said electric fan,

K. a timer electrically coupled to said electric fan and a battery in said battery compartment so as to obtain circulation of air in said chambers by said electric fan for controlled periods of time, such that cool air is forced through said vents to cool a person on the chair,

L. said seat rest includes:

(1) a first section,

(2) a second section,

(3) a third section,

(4) first coupling means for pivotally joining said first section to said second section at said closed end thereof, so as to permit said first section and said second section to be folded between an open position to a closed position in which said first and second sections are in overlapping relationship to each other,

(5) second coupling means for pivotally joining said second section to said third section at said porous end thereof, so as to permit said second section and said third section to be folded between an open position to a closed position in which said second and third sections are in overlapping relationship to each other, and

(6) third coupling means for pivotally joining said third section to said back rest at said closed end thereof, so as to permit said third section and said back rest to be folded between an open position in which said back rest is inclined relative to said third section to a closed position in which said third section and said back rest are in overlapping relationship to each other,

M. locking means associated with said second and third sections for releasably coupling same together in the open position of the chair,

N. said sections each include

(7) a pair of spaced apart side walls extending substantially vertically between said porous end and said closed end, and

(8) at least one open end on each one of said sections, and

O. said locking means includes

(9) a latch member mounted on each one of said side walls of said second or third sections for reciprocal movement between extended and retracted positions, in extended position bridging the adjacent open ends of said second and third sections for interconnecting the latter, said latch member in the retracted position being disposed inwardly of said free end of the one of said sections it is mounted on, and

(10) a sleeve mounted on each one of the corresponding one of said side walls in longitudinal alignment with said latch member and adapted to receive therein in bridging relation said latch member in the open position of the chair.

4,141,586

VEHICLE SEAT

Walther Göldner, Ebersbach, and Helmut Wall, Kirchheim/-Teck, both of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim/Teck, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 843,873

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648951

Int. Cl.[2] A47B *39/00*; A47C *7/62, 7/54*

U.S. Cl. 297—191 **9 Claims**

1. A vehicle seat comprising

a seat part,

a backrest pivotally connected with said seat part at a first pivot axis and being arrestable in selectable positions, said backrest includes a pillow carrier including lateral struts,

at least one armrest and folding table, respectively, operatively carried on said backrest,

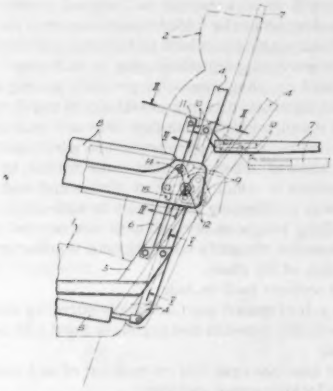
a carrier of said armrest and folding table, respectively, constituting at least one parallelogram, the latter having two connecting rods extending in a longitudinal direction of said backrest, said at least one parallelogram being disposed on at least one lateral side of said backrest,

said two connecting rods comprising a first connecting rod constituting a part of said pillow carrier of said backrest, said latter mentioned part being pivotally mounted about said pivot axis of said backrest, a second connecting rod being articulated to said seat part at a second pivot axis at an unchangeable position relative to said first pivot axis of said backrest,

a connection part constituting part of said parallelogram being articulated to said second connecting rod, said con-

nection part being pivotally connected with said first connecting rod,

said armrest and folding table, respectively, being supported at least in a use position thereof on both of said connecting rods and swingably relative to the latter,



said part of said pillow carrier of said backrest forming said first connecting rod constitutes one of said lateral struts of said backrest,

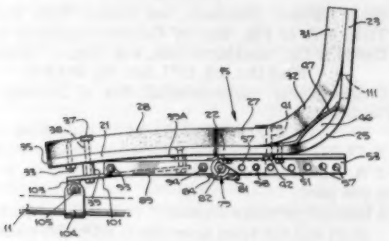
said second connecting rod constitutes a rod disposed in a pivot plane of said lateral strut and uniformly spaced parallel from the latter.

4,141,587

CYCLE SEAT WITH BACK SUPPORT

Stephen A. Holcomb, 1369 N. Los Robles Ave., Pasadena, Calif. 91104

Filed Feb. 10, 1978, Ser. No. 876,647
Int. Cl.[2] B62J *1/00*
U.S. Cl. 297—195 **6 Claims**



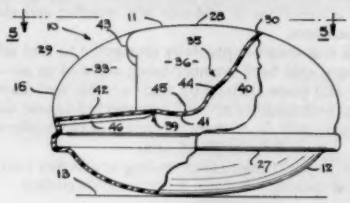
1. A seat for a conventional cycle having an upper frame member and a protruding seat post and comprising a backrest, a seat base joined to the backrest, transversely spaced rails each having longitudinally spaced apertures therein and fixed to the seat base bottom; a seat post bracket adapted to clamp to said seat post, rearward diverging pierced arms on said bracket, a latch rod adapted to pass through said pierced arms and reside in selected pairs of said aligned rail apertures to secure said rails and the seat fixed thereto longitudinally with respect to said post bracket, clamp means forward of said post bracket for securing said seat base to said upper frame member, a resilient pad on said seat base and backrest, a leaf spring intervening between said pad and said seat base and backrest, and means securing said leaf spring between said pad and said seat base and backrest.

4,141,588

ROCKING LOUNGE CHAIR

Paul R. Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677

Filed May 15, 1978, Ser. No. 905,895
Int. Cl.[2] A63G *19/02*
U.S. Cl. 297—258 **5 Claims**



1. A rocking lounge chair for children, which comprises:

an ellipsoidal-shaped body having a top surface, a forwardly extending T-shaped rectangular opening in the top surface including a first section having an upper short side and a pair of downwardly sloping long sides connected to laterally extending incremental sides of a wider second section having downwardly sloping short sides connected to a lower long side at the front end of the body and a lower surface adapted for rocking on a ground surface,

a body rest suspended downwardly in the opening comprising a pair of spaced apart sidewalls having upper arcuate edges connected to the long sides of the first section, then folded laterally around the corners of the incremental sides of the second section and than folded again to a connection with the long sides of said second section of said opening and the lower edges connected to an L-shaped bottom wall having a back portion extending downwardly and forwardly from a connection with the upper short side of said opening, a horizontally extending seat portion and a downwardly and forwardly sloping leg portion connected to the short side at the lower end of said opening, and

bumper means extending around said body and spaced from the ground surface for rocking contact with said ground surface when rocked by a child reclining in the body rest so as to prevent said body from overturning beyond a safe angle from the verticle, the bumper means being adapted to exert a reactive force and return said body to an upright position.

4,141,589

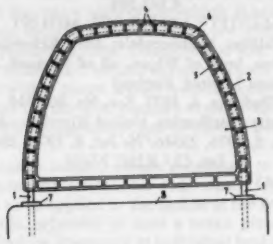
HEADREST FOR SEAT OF VEHICLE

Jean C. Schneider, Plaisance 2, La Chaux-de-Fonds, Switzerland (2300)

Continuation of Ser. No. 708,864, Jul. 26, 1976. This application Dec. 27, 1977, Ser. No. 864,827
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—397 **8 Claims**

1. In an auto seat headrest unit of the type having a frame with a pair of spaced leg portions adapted for attachment to the seat and energy absorbing means spanning the frame for absorbing energy, the improvement comprising reinforcement means surrounding the frame connecting said energy absorbing means to the frame, said reinforcement means having a

plurality of segments, each said segment having a thickness sufficient to absorb shocks in the area of said frame, and said



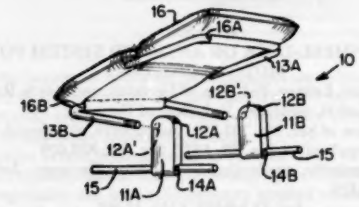
segments cooperating with said energy absorbing means in the absorption of a shock to said headrest unit.

4,141,590

COLLAPSIBLE FURNITURE STRUCTURE

Percival Lafer, Rau Lavapes No. 22 CEP01519, Sao Paulo, Brazil

Filed Dec. 23, 1977, Ser. No. 863,620
Claims priority, application Brazil, Jan. 17, 1977, 7700317
Int. Cl.[2] A47C *1/12, 7/02*
U.S. Cl. 297—440 **10 Claims**



1. A collapsible structure adapted for use as an item of furniture comprising:

A. a pair of relatively thick, upstanding support blocks, each of which includes

i. an upper end portion

ii. a lower end portion adapted to rest upon a suporting surface, and

iii. connecting means formed at at least two separate locations in the upper end portion of each said support block, said connecting means being angularly displaced from one another;

B. at least two frame elements, each of which

i. is substantially U-shaped including two spaced apart extremities, and

ii. is formed of a rigid material that resists bending and deformation under load;

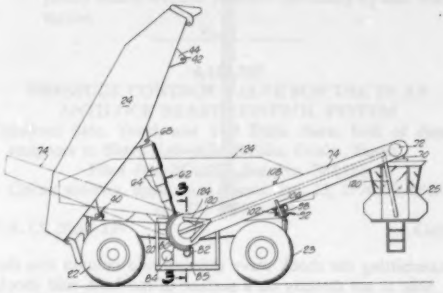
C. the spaced apart extremities of said frame elements being removably securable by said connecting means to said support blocks so that said frame elements are supported from said support blocks in extending positions angularly displaced from one another.

4,141,591

BI-DIRECTIONAL DUMP TRUCK

Randall O. Spicer, 76930 Iroquois Dr., Indian Wells, Calif. 92260

Division of Ser. No. 630,406, Nov. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 446,914, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 224,200, Feb. 7, 1972, abandoned. This application Apr. 7, 1977, Ser. No. 785,508
Int. Cl.[2] B60P *1/28*
U.S. Cl. 298—17.6 **18 Claims**



1. In a power-driven dump truck vehicle, the combination of:

a wheel-support frame;

a body mounted on the frame to carry a load, comprising pivotal mounting means near the two ends, respectively, of the vehicle frame,

each of said pivotal mounting means including trunnion means mounted on said body and complementary trunnion bearing means mounted on said vehicle frame, said trunnion bearing means comprising a pivotally mounted upper section and a fixedly mounted lower section;

remotely controlled means including fluid-pressure-actuated means to swing each of said upper sections between opened and closed positions;

a cab movable between two limit positions near the opposite ends, respectively, of the vehicle to dispose the cab in a leading position relative to the travel direction;

means operable from inside the cab to shift the cab to said two limit positions selectively, said cab being equipped with controls to drive and steer the vehicle from either end of the vehicle; and

means operable to tilt the body towards the two ends of the vehicle selectively to dump its load whereby with the cab at one end of the loaded vehicle the vehicle may be driven in the direction of said one end to a dump site, whereupon the cab may be shifted away from said one end of the vehicle to the opposite end of the vehicle and then the body may be tilted towards said one end of the vehicle to dump the load.

4,141,592

METHOD AND DEVICE FOR BREAKING HARD COMPACT MATERIAL

Erik V. Lavon, Saltsjo-Boö, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sep. 17, 1976, Ser. No. 724,691
Claims priority, application Sweden, Sep. 19, 1975, 7510557
Int. Cl.[2] E21C *37/06*
U.S. Cl. 299—16 **14 Claims**

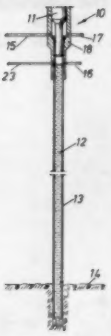
1. A method of breaking a hard compact material, such as rock, in which at least one hole is pre-drilled, comprising:

maintaining a column (12) of substantially incompressible fluid having a length which exceeds the hole depth,

filling the free cross sectional area of the hole with fluid at

the one end of said column which directly contacts a surface of the hole.

accelerating an impact body toward said fluid column by means of an accelerating device to impact said fluid column and generate a shock wave in said column outside the hole, said impact body having a shorter length than that of said column, and



transmitting the shock wave through said column into the hole to act directly on a surface of the hole, said shock wave having a sufficient amplitude to cause cracks to form in the material,

said fluid column being of sufficient length with respect to the length of said impact body for preventing a pressure increase caused by occurring shock wave reflections from arising in said column outside said hole.

4,141,593

COAL PLANE WITH CHAIN OPERATED TURNING HEAD

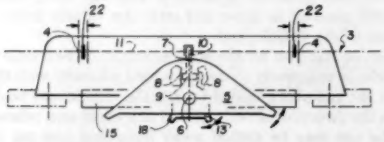
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,435

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627484

Int. Cl.[2] E21C *27/34*

U.S. Cl. 299—34 **5 Claims**



1. A coal plane for use against a coal face, comprising a plane body having a plane guide, a plane chain arranged in said plane guide having chain ends engaged on respective sides of said plane body, a bit support mounted in said plane body for pivotal movement about a vertical axis in a working direction toward the coal face, a horizontal control shaft mounted orthogonally to the longitudinal direction of said plane chain on said plane body to actuate said bit support, a turning shaft on said control head rotatable therewith, means defining two spaced apart slide plates on said bit support engaged with said turning head, a lever arm secured to said control shaft for rotation therewith, a control chain mounted for reciprocating motion and engaged with said lever arm and connected to the ends of said plane chain acting on said plane body with clearance of motion for transforming a reciprocating movement of said control chain in dependence on the pulling direction of said plane chain during pivoting of said turning head on said control shaft into a pivotal movement of said bit support about said vertical axis in a working direction toward the coal face.

4,141,594

MANIPULABLE TOOL MOUNT

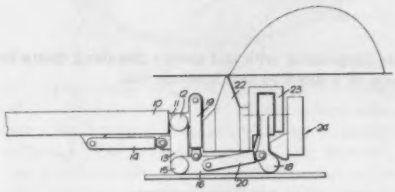
Reginald A. Phillips, Skelmersdale; John Eckersley, and Terence Hamilton, both of Wigan, all of England, assignors to Gullick Dobson Limited, England

Filed Jun. 6, 1977, Ser. No. 803,910

Claims priority, application United Kingdom, Jun. 8, 1976, 23540/76; Jun. 8, 1976, 23546/76; Jul. 8, 1976, 28405/76

Int. Cl.[2] E21C *27/00*

U.S. Cl. 299—43 **22 Claims**



1. A traversable mining machine having mount for a mineral winning head at an end part of the mining machine with respect to its direction of traverse, the mount including a plurality of links pivoted successively one to another and powered means for pivoting the successive links about their pivot axes in extending and manipulating the head for cutting at least to one side of the mchine in its traverse direction, and wherein said links and powered means also allow the mineral winning head to be retracted so that at least a main body of the head lies in an angled configuration of the links behind an end of the first of the links that is to said one side and alongside the first link and the next link pivoted thereto, and the overall link and head body structure within the confines of the machine sideways of the traverse direction.

4,141,595

ANTI-WHEEL-LOCK OR ANTI-SKID SYSTEM FOR MOTOR VEHICLES

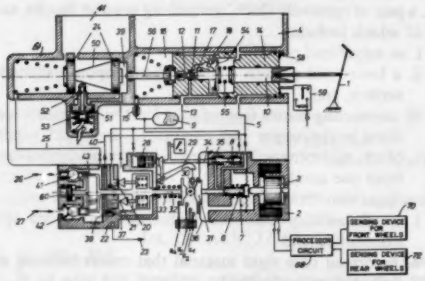
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 703,798, Jul. 9, 1976, abandoned. This application Sep. 20, 1977, Ser. No. 835,079

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1975, 2531525

Int. Cl.[2] B60T *8/10, 13/68*

U.S. Cl. 303—10 **20 Claims**



1. An anti-wheel lock braking system for vehicles, comprising:

a first pressure source;

wheel motion sensing means connected to the first pressure source, for generating signals indicative of a speed condi-

tion of the wheels, said signals being applied to the first pressure source;

first pressure control means connected to the first pressure source, for controlling the pressure to be applied to the brakes at the rear wheels of the vehicle in accordance with the signals applied to the first pressure source;

a second pressure source connected to the first pressure control means, said second pressure source comprising a cylinder with a piston which is acted upon by a pressure controlled by the first pressure control means in accordance with the signals applied to the first pressure source; and

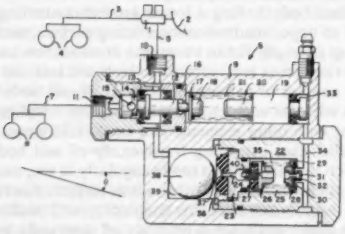
second pressure control means connected to the first and second pressure source, for individually controlling the pressure to be applied to the brakes at the front wheels of the vehicle, whereby at least a brake pressure decrease may take place separately at individual brakes of the front wheel brakes.

4,141,596

HYDRAULIC BRAKE CONTROL ASSEMBLY RESPONSIVE TO VEHICULAR DECELERATION

Hiroshi Takeshita, Chiryu, and Takashi Nagashima, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 2, 1977, Ser. No. 847,935
Claims priority, application Japan, Nov. 4, 1976, 51-133047
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 C **19 Claims**



1. An improved hydraulic brake control assembly for automotive vehicles having front and rear wheel brake means and a hydraulic braking master cylinder fluidically connected to each of said brake means comprising:

a. valve proportioning means interposed between said master cylinder and at least one of said wheel brake means for regulating the hydraulic pressure applied to said at least one of said wheel brake means from said master cylinder in accordance with vehicular load, wherein said valve proportioning means includes a reciprocable proportioning piston subjected at a first section formed in said valve proportioning means to the hydraulic pressure in said at least one of said wheel brake means and at a second section formed in said valve proportioning means to the hydraulic pressure from said master cylinder, said proportioning piston being normally urged to a position allowing hydraulic pressure communication between said first and second sections;

b. control means responsive to vehicular deceleration and hydraulic pressure from said master cylinder for controlling said valve proportioning means in accordance with vehicular load wherein said control means includes

(i) slidable piston means engaged with said reciprocable proportioning piston for applying an urging force on said proportioning piston varied in response to hydraulic pressure applied to said piston means, said piston means normally urging said proportioning piston to an open hydraulic pressure communication position;

(ii) first passage means for supplying hydraulic pressure from said master cylinder to said piston means;

(iii) first valve means interposed in said first passage means for controlling admission of the hydraulic pressure supplied to said piston means in response to vehicular deceleration;

(iv) orifice means interposed in said first passage means for throttling the hydraulic pressure supplied to said piston means; and

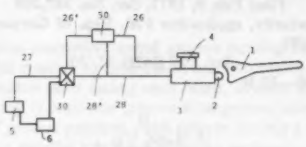
(v) second valve means positioned parallel to said orifice means in said first passage means and normally closed, said second valve means having a valve portion being opened when a predetermined difference in hydraulic pressure is reached on opposite sides of said orifice means for supplying the hydraulic pressure to said piston means without pressure throttling by said orifice means.

4,141,597

PRESSURE CONTROL VALVE FOR USE IN AN ANTILOCK BRAKE CONTROL SYSTEM

Takefumi Sato, Tenri, and Yuji Dohi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 762,110
Claims priority, application Japan, Jan. 23, 1976, 51-6842
Int. Cl.[2] B60T *8/04*
U.S. Cl. 303—119 **4 Claims**



1. In an antilock brake control system including a master cylinder and a through conduit, a wheel cylinder, means for detecting the wheel lock or impending lock, means for returning the brake oil contained within the wheel cylinder to a reservoir associated with the master cylinder when the wheel lock or impending lock is detected, said returning means including an electromagnetic cross valve for controlling the supply direction of the brake oil in response to the detecting means and a pressure control valve interposed within a feedback loop from the electromagnetic cross valve to the reservoir and being responsive to a brake oil pressure in the through conduit, said pressure control valve comprising:

a valve member for suddenly reducing the wheel cylinder pressure to a predetermined value continuously proportional to the pressure created in said master cylinder upon energization of said electromagnetic cross valve; and

means for gradually reducing the wheel cylinder pressure while the electromagnetic cross valve is energized.

4,141,598

TRACK ROLLER ASSEMBLY

Lawrence R. Cline, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 21, 1978, Ser. No. 879,644
Int. Cl.[2] B62D *55/14*
U.S. Cl. 305—28 **4 Claims**

2. A track roller assembly comprising:

a roller shaft having opposed ends;

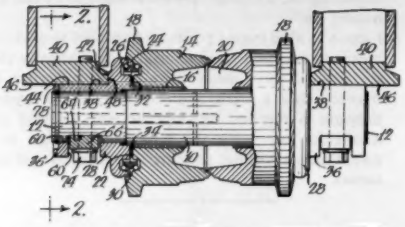
a track roller journalled on said shaft intermediate its ends;

a pair of end collars, one on each end of said shaft and each having a first face directed toward said roller and a surface remote from said first face configured to mate with a track roller frame at a desired point of attachment thereto, said surface including a second face in force bucking relation to said first face and a third face extending generally axially of said shaft;

thrust washers interposed between said first faces and said roller;

aligned keyways in said end collars and said shaft ends oppositely of said third faces and extending across said shaft axis;

keys in said keyways for preventing relative rotation between said end collars and said shaft; and



securing means for simultaneously (a) securing said keys in said keyways and (b) affixing said end collars to a track roller frame.

4,141,599

ENDLESS TRACK

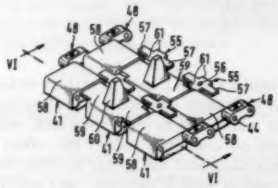
Hans-Peter Stolz, Ettlingen, Fed. Rep. of Germany, assignor to Ing. Ludwig Pietzsch, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 9, 1977, Ser. No. 767,209

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1976, 2614691

Int. Cl.[2] B62D 55/20

U.S. Cl. 305—35 R **7 Claims**



1. An endless track for propelling vehicles and the like, comprising

(a) a plurality of transversely spaced columns of longitudinally extending body members containing at their forward and rear ends aligned through openings, respectively;

(b) a plurality of transversely spaced columns of longitudinally extending connector links arranged on opposite sides of said columns of body members, respectively, said connector links each containing parallel transverse through openings adjacent their forward and rear ends, respectively, the openings in the forward and rear ends of said connector links being aligned with the openings contained in the rear and forward ends of said body members, respectively; and

(c) a plurality of rod members each extending transversely the entire width of the track through the aligned openings contained in corresponding transverse rows of said body members and said connector links, respectively;

(d) two connector links of each transverse row comprising end connector links arranged at opposite ends of the associated rod members adjacent the outermost faces of the outermost body members of the row, respectively, said two end connector links being spaced a greater distance than the sum of the widths of the body members and the remaining connector links arranged therebetween, thereby to define predetermined clearance spaces of manufacturing tolerance between the adjacent surfaces of said body members and said connector links;

(e) at least one of said body members including laterally extending web portions the extremities of which are spaced from the adjacent body member by the said clearance space, the width of said clearance spaces being such that upon longitudinal flexure of each rod in a direction transverse to the direction of movement of the track, portions of the adjacent surfaces of the body members and the connecting links are brought into abutting engagement to provide lateral support in the form of a bridge for absorbing the transverse bending stress of the link.

4,141,600

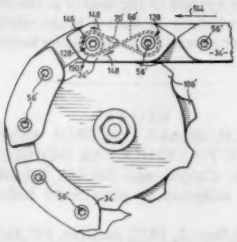
TRACTION ELEMENT FOR A VEHICLE TRACK

Robert J. Orpana, Ste. Foy, Canada, assignor to Panatrac Manufacturing Corporation Limited, Thornhill, Canada

Continuation-in-part of Ser. No. 594,140, Jul. 7, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,884

Int. Cl.[2] B62D 55/20

U.S. Cl. 305—36 **5 Claims**



1. A traction element for use in an endless track for a tracked vehicle, the element comprising:

a resilient body having a lower ground-contacting surface, and an upper road wheel-contacting surface, said surfaces being generally flat in transverse cross-section and including respective end portions which are inclined towards one another to define tapered ends of said body;

means adjacent each end of said body for coupling the element with other elements in a track, said means defining parallel axes extending transversely of said body, about which the element can move angularly in use, each of said coupling means comprising a non-resilient sleeve embedded in and mechanically coupled to said resilient body, said sleeve defining: a plurality of outwardly projecting vanes disposed generally radially with respect to said axis and mechanically coupling the sleeve to said resilient body; and a bore which extends about the relevant one of said parallel axes and which is shaped to receive in non-rotatable fashion a shaft for coupling the traction element with an adjacent element in the track, whereby turning of said shaft with respect to the element in use causes the sleeve to turn and torsionally stress the resilient body of the traction element; and,

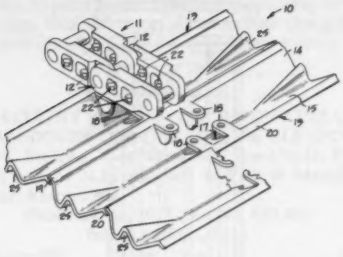
tensile reinforcing means extending between said coupling means inside said resilient body and comprising two flexible cables disposed in positions spaced transversely with respect to said parallel axes of the element, each cable being arranged to define an endless loop which extends around said non-resilient coupling sleeves, and wherein each of said non-resilient coupling sleeves of the element includes two circular formations disposed in generally parallel planes spaced longitudinally of said axis of the elements, each formation defining a peripheral groove receiving one of said flexible cables, and wherein said outwardly projecting vanes of the sleeve extend between said disc-like formations;

said upper and lower surfaces of the resilient body including respective central portions extending parallel to one another, and said lower surface includng radiused surface portions located at each end of said central portion such that said end portions merge smoothly into the central portion, each said radiused portion defining, in cross-section, an arc centered on the adjacent one of said axes, whereby the traction element can pivot on the relevant one of said radiused surface portions when the element moves angularly about the associated axis in use.

4,141,601
TRACK SHOE WITH RETAINING FLANGES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1977, Ser. No. 827,909
Int. Cl.[2] B62D 55/28
U.S. Cl. 305—54 36 Claims



1. An endless track assembly for a track-type vehicle comprising

an articulated link assembly including a plurality of pivotally interconnected links,

a track shoe releasably connected to each pair of laterally spaced links of said link assembly comprising

a pair of sidewalls disposed in diverging relationship relative to each other and extending from an apex to a base of said track shoe,

a lug disposed on each lateral side of said track shoe at the termination of each of said sidewalls at the base thereof and extending outwardly therefrom, and

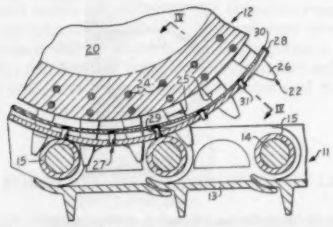
flange means disposed adjacent to each lug and extending inwardly therefrom and inwardly from a respective one of said sidewalls, and

fastening means releasably securing said track shoe to each of said pair of links.

4,141,602
TRACK-TYPE VEHICLE WHEEL HAVING CONTROLLED IMPACT RESISTANCE

Roger L. Boggs, East Peoria, Ill., and John W. Sogge, Cedar Rapids, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 712,566, Aug. 9, 1976, Pat. No. 4,087,136. This application Oct. 11, 1977, Ser. No. 841,500
Int. Cl.[2] B62D 55/12
U.S. Cl. 305—57 2 Claims



1. A wheel of a track-type vehicle having a track, comprising:

a hub;

a plurality of arcuately spaced apart teeth each having an opening and being connected to said hub;

a first annular spring assembly having a plurality of generally radially extending openings and being positioned in said openings of the teeth, each of said openings of the first spring assembly being positioned between adjacent teeth;

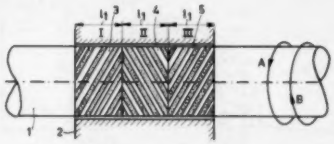
a second annular spring assembly positioned in said openings of the teeth and forcibly urging against said first spring assembly; and

a plurality of plungers, each extending through an associated opening of the first spring assembly and movable towards and from said hub and controllably biased outwardly by the second spring assembly, said teeth being spaced apart a distance sufficient for receiving a pin bushing of the associated track between adjacent teeth, said pin bushing contacting said first annular spring and a selected one of said plungers and biasing a portion of said second spring with said plunger a preselected distance toward said hub in response to said contact.

4,141,603
ROTATION-INSENSITIVE SPIRAL GROOVE BEARING

Gerrit Remmers, and Leonardus P. M. Tielemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,503
Claims priority, application Netherlands, Sep. 3, 1976, 7609817
Int. Cl.[2] F16C 32/06
U.S. Cl. 308—9 6 Claims



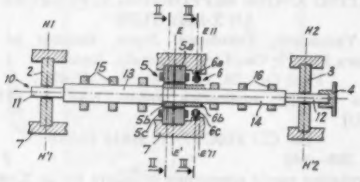
1. A rotation-insensitive spiral groove bearing having two parts rotatable relative to each other, and two bearing surfaces on the respective parts facing each other, at least one of said surfaces having at least one groove arrangement consisting of a pluraity of groove patterns, each pattern having a multiplicity of shallow parallel lubricant pumping grooves,

wherein said one surface has three only adjoining groove patterns, the outer groove patterns having a pumping effect in a same first direction, and the inner pattern therebetween having a pumping effect in a second direction opposite said first direction the groove patterns thus providing for lubrication of the facing bearing surfaces with relative rotation in either of two opposite directions.

4,141,604
ELECTROMAGNETIC BEARINGS FOR MOUNTING ELONGATE ROTATING SHAFTS

Helmut Habermann, and Maurice Brunet, both of Vernon, France, assignors to Societe Europeene de Propulsion, Puteaux, France

Filed Dec. 22, 1976, Ser. No. 753,282
Claims priority, application France, Dec. 24, 1976, 75 39761
Int. Cl.[2] F16C 39/00
U.S. Cl. 308—10 7 Claims



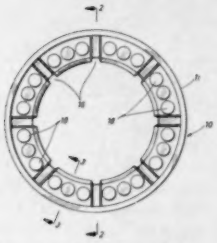
1. A mounting assembly, including frame means, for an elongate rotary body having a substantially horizontal axis of rotation and opposite end portions, said mounting assembly comprising radial bearings supporting the body at its respective end portions, and at least one active electromagnetic radial bearing for supporting the body intermediate the end portions thereof, said electromagnetic bearing comprising an annular armature mounted on the body, a fixed armature mounted to said frame means disposed around and spaced from the annular armature, said electromagnetic bearing having coils mounted

on said fixed armature, and at least one detector, a portion of which is mounted to said frame means and another portion of which is mounted to said rotary body, for sensing the radial position of the rotary body intermediate the end portions thereof, signals from said detector being operative to control the magnetic field produced between said fixed armature and said annular armature of the electromagnetic bearing to provide a support of predetermined rigidity for the rotary body.

4,141,605
BEARING

Mathew B. Riordan, and Arley G. Lee, both of Houston, Tex., assignors to Eastman Whipstock, Inc., Houston, Tex.

Filed Jul. 2, 1976, Ser. No. 702,192
Int. Cl.[2] F16C *23/00, 25/00, 27/06*
U.S. Cl. 308—26 **9 Claims**



9. A thrust bearing assembly for transmitting the axial load on the output shaft of a downhole motor between the shaft and the motor comprising a housing connected to the motor through which the output shaft extends, a plurality of bearings located in the housing, each bearing comprising a bearing casing having a cylindrical portion and an inwardly extending support member attached to the cylindrical portion between the ends thereof, a body of elastomeric material located on opposite sides of the support member, and a plurality of wear members positioned in the body of elastomeric material on both sides of the support member to transmit the load imposed on the bearing to the support member, said wear members being supported by the body of elastomeric material so that each wear member may adjust individually to the load on each member, means for transmitting the axial load on the output shaft to the bearings, and means for transmitting the load on the bearings to the bearing housing.

4,141,606
ROTATING ANODE SUPPORTING STRUCTURE FOR AN X-RAY TUBE

Toshio Yamamura, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 28, 1976, Ser. No. 736,494
Claims priority, application Japan, Nov. 4, 1975, 50-149136[U]
Int. Cl.[2] F16C *27/08;* H01J *35/00*
U.S. Cl. 308—140 **2 Claims**

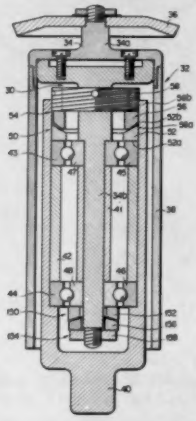
1. A rotating anode supporting structure for an X-ray tube, comprising:

a radial bearing mounted between a rotary shaft and a fixed base element, the rotary shaft rotating together with a target and provided with an integrally formed skirt-like rotor;

a first annular means having one side face abutting against one side face of one of the races of the bearing and the other side face forming a concave means with an inclined face of frusto-conical shape; and

a second annular means including an annular member movable in the radial direction, one side face of the annular member abutting against the other side face of the first annular means

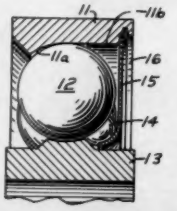
forming a convex means having a partial spherical face and permitting a pushing force of the second annular means to be transmitted with uniform force distribution to the bearing through the first annular means, said second annular means further including a tubular nut having the outer circumference provided with an externally threaded portion, said tubular nut being rotated to provide said pushing force to the other side face of the annular member of the second annular means.



4,141,607
EXTREME TEMPERATURE ROLLING CONTACT BALL BEARINGS

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Continuation-in-part of Ser. No. 688,225, May 20, 1976, abandoned, which is a division of Ser. No. 424,553, Dec. 13, 1973, Pat. No. 3,969,005. This application Jan. 25, 1978, Ser. No. 872,218
Int. Cl.[2] F16C *19/26*
U.S. Cl. 308—200 **2 Claims**



1. A rolling contact bearing comprising:

an outer race,

said outer race being circular,

an inner race,

said inner race being circular and coaxially located radially inwards of said outer race,

first rotating means,

said first rotating means comprising major balls located between and in rolling contact with said outer race and said inner race,

second rotating means,

said second rotating means comprising spacing balls which are interposed between and in rolling contact with said major balls,

said spacing balls being positioned radially inwards of said

major balls and axially displaced from a plane through the centers of same,

a spring-disk,

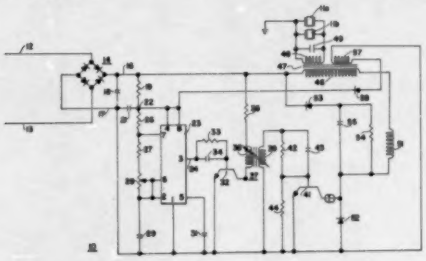
said spring-disk being affixed to said outer race and serving to hold said second rotating means in position against said first rotating means,

said spring-disk being ring-shaped, thin axially and broad radially, to permit same to deflect appreciably in the axial direction, thus serving to accommodate changes in size and position of said major balls and said spacing balls.

4,141,608
CIRCUITRY FOR DRIVING A NON-LINEAR TRANSDUCER FOR ULTRASONIC CLEANING

Franklin E. Breining, Toms River, and Franklin H. Edelstein, Kearny, both of N.J., assignors to L & R Manufacturing Company, Kearny, N.J.

Filed Nov. 10, 1977, Ser. No. 850,302
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—316 **3 Claims**



1. In combination:

a non-linear ultrasonic transducer having first and second terminals;

a capacitor connected between said first and second terminals to form a parallel circuit with said non-linear transducer;

means for exhibiting an inductive reactance in series with said parallel circuit to thereby form a non-linear series resonant circuit having a series resonant frequency; and

means for applying a square wave having a fundamental frequency substantially equal to said series resonant frequency across said series resonant circuit;

said means for applying said square wave includes a transistor and said means for exhibiting said inductive reactance includes an inductor connected in the collector circuit of said transistor, and a transformer having a primary and a secondary; said primary being connected to said inductor and said secondary being connected across said parallel circuit.

4,141,609
SYSTEM FOR EFFECTING ACCESS INTO SEALED ENCLOSURES

Gerald A. Eisert, Hastings, Minn., assignor to Central Research Laboratories, Inc., Red Wing, Minn.

Filed Nov. 25, 1977, Ser. No. 854,884
Int. Cl.[2] A61G *11/00*
U.S. Cl. 312—1 **9 Claims**

1. A system for effecting access for performing work within a sealed enclosure, said system comprising:

(A) an elongated arm-length impermeable leak-proof flexible sleeve,

(B) an annular flanged fitting secured in sealing relation in a port in a wall of said enclosure,

(1) said fitting including an outwardly extending annular lip having at least one continuous groove extending around its outer periphery,

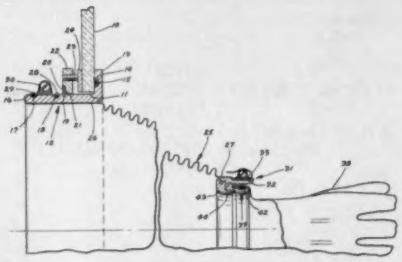
(2) one end of said sleeve extending through said fitting and folded back aginst the outer periphery of said lip, and (3) a resilient fastening ring securing the sleeve in sealing engagement in said groove,

(C) a wrist bushing secured in sealing relation to the opposite end of said sleeve,

(1) said bushing comprising a ring having an outer peripheral groove,

(2) said sleeve being rigidly clamped in sealing relation in said groove,

(3) said bushing having a continuous sealing surface extending around its inner periphery and a continuous groove adjacent said sealing surface,



(D) an annular support ring detachably secured in said wrist bushing,

(1) said support ring having an outer peripheral deformable semi-rigid bead engaging the inner peripheral groove of said bushing, and

(2) a continuous channel spaced from the bead and extending around the outer periphery of the support ring, and

(E) a glove secured in sealing relation on said support ring,

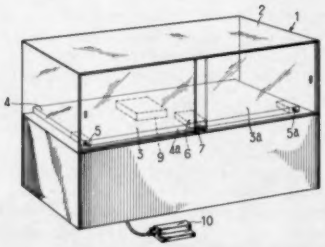
(1) the cuff of said glove engaging the outer periphery of the support ring, and a resilient fastening ring securing the glove in sealing engagement in said groove, and

(2) the outer periphery of said resilient ring being in sealing engagement with the sealing surface of said bushing.

4,141,610
SHOW CASE

Shoichiro Ando, 1-3-3, Nakameguro, Meguro-ku, Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 895,969
Int. Cl.[2] A47F *3/00*; H01H *47/00*
U.S. Cl. 312—114 **7 Claims**



1. In a rectangular transparent show case having the top, bottom, opposite ends and rear side which are closed and the front side an upper portion of which is open and including a pair of sliding doors received in said open upper portion of the front side and provided at the inner edges with holes adapted to align with each other when said doors are in the closed position and hollow display stand extending across the interior of said case for supporting articles of commerce thereon, characterized by the provision of an electronic circuit including a

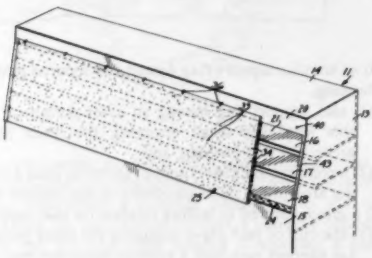
selector switch and an electronic lock for locking and unlocking said doors including a solenoid provided in said display stand in a position corresponding to the position of said holes when the doors are in the closed position, a lock pin movable between the retracted position in which said lock pin is received in said solenoid and the extended position in which said lock pin is received in said holes in the doors in the closed position of the doors, a receiver for receiving radio waves from an external source, door closing detection means and a solenoid drive circuit electronically connected to said receiver for driving said lock pin to the retracted position upon receipt of the output signal from said receiver and also connected to said door closing detection means through a timer for driving the lock pin to the extended position in response to the detection of the closing of said doors by door detection means.

4,141,611

COVER FOR DISPLAY TYPE REFRIGERATING CABINET

John N. De Leon, 837 N. Feather Ave., La Puente, Calif. 91746

Filed Dec. 16, 1977, Ser. No. 861,172
Int. Cl.[2] A47F 3/04
U.S. Cl. 312—116 **2 Claims**



1. An insulating cover
for covering the forward facing access opening of a vertical display type refrigerating cabinet comprising
a pair of elongate overlying sheets of relatively thin flexible material,
said sheets being secured together along their edges,
said sheets being further secured together along parallel seam lines extending lengthwise of said sheets to form contiguous hollow panels extending the length of said cover,
relatively thick layers of heat insulating fibers at least substantially filling said panels,
means for removably suspending the upper side edge of said cover along the upper edge of said opening whereby the remainder of said cover drapes over said opening,
said seam lines forming hinge lines along which said cover may be folded,
said cabinet having supporting openings therein above said access opening,
said suspending means comprising
hooks attached to said cover along said upper edge,
said hooks having downwardly inclined portions adapted to extend through said supporting openings whereby the weight of said cover causes said hooks to press said cover into sealing engagement with said cabinet.

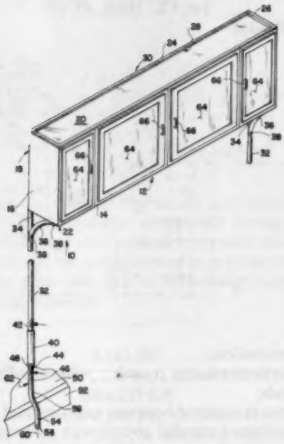
4,141,612

PORTABLE STORAGE APPARATUS

Robert Rowe, 1840 Bloor St. E. #1011, Mississauga, Ontario, Canada (L4X 1 T2)

Filed Sep. 30, 1977, Ser. No. 838,103
Int. Cl.[2] A47F 5/08
U.S. Cl. 312—245 **2 Claims**

1. A portable storage apparatus comprising a storage enclosure having walls, a base and an uppermost surface, a pair of uppermost post portions, a pair of lowermost post portions, said pair of uppermost post portions having the uppermost ends thereof fixedly secured to said enclosure, said pair of lowermost post portions extendably affixed to said pair of uppermost post portions, means to manually adjust said pair of lowermost post portions extendably and relative to said pair of uppermost post portions, said pair of lowermost post portions each having an uppermost portion thereof disposed adjacent to a lowermost portion of said uppermost pair of post portions, the longitudinal axis of said uppermost portion of said lowermost pair of post portions being displaced radially outwardly from the longitudinal axis of the lowermost portion of said pair of lowermost post portions, a pair of tubes, said pair of tubes slidably affixed over said lowermost portions and said uppermost portions of said lowermost pair of post portions, a pair of threaded rods, one end of said threaded rods threadingly engaged and co-axially aligned to said uppermost portion of said



lowermost pair of post portions, a pair of nuts, said pair of nuts threadingly engaged and fixedly secured to said pair of rods, said pair of tubes being movable upwardly along said lowermost past portions exposing said pair of rods and said pair of nuts for the vertical adjustment of said pair of lowermost post portions, the other end of said pair of rods engaged within a hole located at said lowermost portion of said uppermost pair of post portions and aligned co-axially therewith, whereby rotating said pair of rods positions said threaded rods along said longitudinal axis providing vertical support for said pair of uppermost post portions having the lowermost portions thereof resting on said pair of nuts, means to support said pair of tubes covering said threaded rods and said pair of nuts in a lowermost position of said pair of tubes, a rubber-like gasket, said gasket secured to said uppermost surface, said gasket located adjacent the marginal edges of said uppermost surface, said gasket being disposed in touching engagement with a ceiling vertically supporting said enclosure.

4,141,613

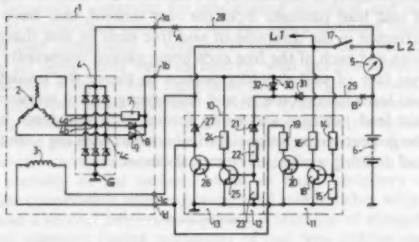
ELECTRICAL GENERATING SYSTEM, PARTICULARLY FOR AUTOMOTIVE USE

Kazumasa Mori, Aichi, and Suguru Sato, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 12, 1977, Ser. No. 814,875
Claims priority, application Japan, Jul. 14, 1976, 51-94139
Int. Cl.[2] H02J 7/14
U.S. Cl. 322—28 **9 Claims**

1. Electrical generating system, particularly for automotive use having

a multiphase generator having armature windings (2) and a field winding (3);
a full wave power rectifier (3) connected to the armature windings, and connected to a main d-c output terminal (1*a*);
a rectifier network (7, 8, 9) connected to the armature winding and to an auxiliary d-c output terminal (1*b*);
a battery (6) connected to the main d-c output terminal (1*a*);
a main controlled semiconductor switch (26) connected in series with the field winding (3) and controlling current through the field winding;
a main voltage sensing circuit (12; 21, 22, 23) connected to the main d-c output terminal and hence to the battery, connected to and controlling conduction of said main controlled semiconductor switch (26) to maintain the output voltage of the alternator, as rectified, at an essentially constant, predetermined level;
a connecting network (30, 32) connecting the main voltage sensing circuit (12) to the auxiliary d-c terminal (1*b*) to



provide a sensing voltage for the main sensing circuit (12) in case of failure of connections from the main d-c output terminal (1*a*) to the main voltage sensing circuit (12),
an auxiliary semiconductor controlled switch (20) and a dropping impedance (19) connected in series therewith, said auxiliary semiconductor switch (20) and dropping impedance (19) forming an auxiliary field supply series circuit (6-17-1*c*-3-1*d*-19-20), the auxiliary field supplied series circuit being connected in parallel to the main controlled semiconductor switch (26); and
an auxiliary voltage sensing circuit (11; 14, 15, 18) having a sensing threshold voltage which is lower than said predetermined voltage level, connected to sense output voltage of said auxiliary d-c output terminal (1*b*) and connected to and controlling conduction of the auxiliary controlled semiconductor switch (20) to provide current through the auxiliary field supply series circuit at a level which is below rated field current due to the presence of the dropping impedance in the series circuit.

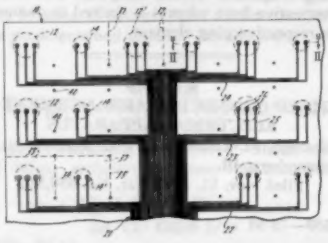
4,141,614

ELECTRICAL CONNECTING MEANS

David P. Piccirillo, Carroll, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed Jun. 14, 1976, Ser. No. 696,030
Int. Cl.[2] H05K *1/04*
U.S. Cl. 339—17 F **3 Claims**

1. As a new article of manufacture, means for providing electrical connections to a plurality of components which are supported in a plurality of rows in fixed positions relative to each other and which have electrical terminals which do not lie in a common flat plane, comprising a thin, flexible sheet formed of a material having high electrical resistance and which is readily manually bendable and of a size to overlie all of said terminals, contact portions on said sheet so positioned therein as to align with the terminals when the sheet is bent to a contour to bring the contact portions thereon into engagement with the terminals, a plurality of electrically conductive lead elements extending over the sheet in adherent relation thereto in closely adjacent but spaced parallel paths between and parallel to the rows and having branching continuation portions extending perpendicularly from said paths along the sheet for a substantial distance to connection with said contact portions, all of the lead elements for the terminals of each row being grouped in a path lying on the same side of the row, said lead elements being formed of a relatively ductile and readily bendable metal, the sheet being formed of a material which is



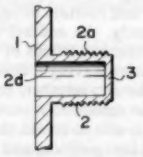
adapted to be cut without fracturing, whereby the sheet may be cut along lines extending from an edge of the sheet to define severed edges extending around three sides of each component without severing any of the lead elements, and whereby such severed edges define hingeable sections bendable away from the component lying within the area bounded by such severed edges to permit removal and replacement of such component.

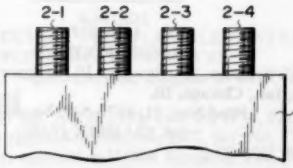
4,141,615

CASING FOR ELECTRICAL EQUIPMENT

Takeshi Takeuchi, and Takao Terasawa, both of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Continuation of Ser. No. 659,192, Feb. 19, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,188
Claims priority, application Japan, Feb. 24, 1975, 50-17250
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—36 **5 Claims**





1. In a casing forming an electrical component for use in a wired television broadcast such as a repeater, a branch unit, a splitter and a coaxial cable-coaxial cable connector, said casing being entirely made from a metallic material, said casing comprising a plurality of walls defining a generally hollow casing enclosure, a plurality of means defining terminal connecting metallic plug elements extending outwardly from at least one of said walls, said plug elements being integrally molded with said at least one wall, each of said plug elements having a generally cylindrical configuration and having external threads for threadedly receiving coaxial cable ends, each of said plug elements having a central bore, and metallic sealing

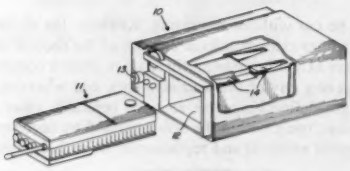
plug seat means in the bores of at least some of said plug elements to seal off said bores, said sealing plug seat means being integrally molded with said plug elements and said casing walls to provide an airtight seal between the inside and outside of the casing to thereby airtightly seal the interior of said casing, said one wall of said casing along with said integrally molded plug elements and said integrally molded plug seat means being of a one-piece integral metallic material, said sealing plug seat means being adapted to be manually ruptured and removed from its respective bore when it is desired to connect a cable end to the respective plug element.

4,141,616

UNITIZED CONNECTOR ARRANGEMENT FOR ELECTRICAL APPARATUS

Ellis J. Gottlieb, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 11, 1977, Ser. No. 850,515
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 M **12 Claims**



1. A connector arrangement for an electronic apparatus having means for receiving an inserted electronic device, the arrangement comprising in combination:

an arm member rotatably mounted and biased into a first position in the apparatus and including contact means, positioning means for positioning the inserted device relative to the contact means, and first and second shoulder portions, the first shoulder portion engaging a projecting portion of the inserted device, as the device is inserted, for causing rotation of the arm member into a second position, said rotation bringing the positioning means and, subsequently, the contact means into engagement with mating contact portions of the inserted device;

enabling means having a first position for preventing rotation of the arm member, and movable by insertion of the electronic device to a second position wherein the arm member is able to rotate, the enabling means being biased into said first position; and

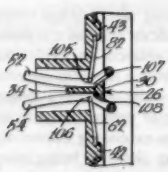
latching means having a projecting portion for engaging the second shoulder portion of the arm member for releasably retaining the arm member in the second position.

4,141,617

LIGHT FIXTURE

Jerry H. Freeman, Mt. Prospect, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Nov. 21, 1977, Ser. No. 853,296
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 L **9 Claims**



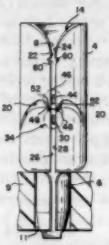
1. A fixture for a light adapted to be mounted on a surface comprising an electrically insulative base member having a front side and a rear side, said base member having a lead aperture therethrough, a substantially T-shaped wall member dividing said lead aperture to define two lead passages therethrough, said substantially T-shaped wall member including a shoulder portion disposed on the front side of said base and having a front face and a rear face and a panel portion narrower than the rear face of the shoulder portion integral with and centrally disposed on the rear face of said shoulder portion and extending rearwardly and generally perpendicular thereof, each side of the rear face of the shoulder portion which extends outwardly of the panel portion defining a flange portion, a pair of electrical connectors mounted on said front side of said base member, each having a free end portion overlying a separate portion of each lead passage and affixed to said base member at a point spaced from said free end, said free ends defining teeth disposed within said lead passages and adapted to pierce the insulation of a lead pulled rearwardly in said lead passages, each of said free ends flexing away from the front side of said base member in response to the insertion of a lead through each of said lead passages from the rear thereof, said leads being deflected in the direction of said free ends by said flange portions and each of the free ends being moved rearwardly of the rear face of said shoulder portion to pierce the insulation of said leads in response to said leads being pulled rearwardly in said lead passages and being forced onto said teeth by said flange portions to make electrical contact with the wire therein and defining a point of electrical contact.

4,141,618

TRANSVERSELY SLOTTED BARREL TERMINAL

Robert P. Reavis, Jr., Statesville; Melvin A. Soderstrom, Advance, and Vasantrai A. Vachhani, Kernersville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 5, 1977, Ser. No. 857,068
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 P **7 Claims**



1. In a stamped and formed electrical contact of metal plate in a barrel configuration and having an open longitudinal wire receiving seam for receipt of one or more wires therein, and a traverse slot intersecting said seam and dividing said barrel configuration into a pair of foremost wire gripping jaws and a pair of tandem wire gripping jaws, the improvement comprising:

said transverse slot having a substantial open width, said foremost set of jaws having tab portions on either side of said seam projecting laterally into said open width of said slot,

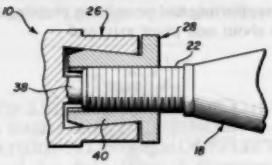
said tandem set of jaws having an enlarged flared entryway communicating with said transverse slot, and

said tab portions projecting partially into said flared entryway without engaging said tandem set of jaws.

4,141,619
CONNECTOR APPARATUS FOR JOINING AN ELECTRICAL BUS WITH A TRANSFORMER STUD

Carlo B. DeLuca, Fairview, Pa., assignor to Teledyne Penn-Union, Edinboro, Pa.

Filed Dec. 21, 1977, Ser. No. 862,732
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—267 8 Claims

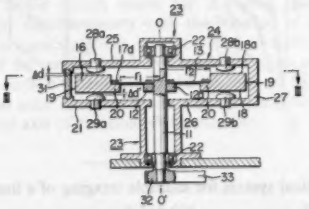


1. Connecting apparatus for establishing electrical and mechanical connections between a bus bar and a threaded transformer stud comprising: a receptacle portion on said bus bar having an open outer end, an interior wall portion defining substantially a section of a right cone and diverging inwardly from said open outer end and a raised cylindrical member defining an abutment surface at an inner end of the receptacle portion and generally concentric with said open outer end, and a connective adapter member comprising a base portion having a plurality of flat surfaces about an outer periphery to facilitate cooperative inter-engagement of said member with a tool, and a second portion comprising a plurality of elongate resilient segments flaring outwardly of said base portion and having outer surfaces defining a section of a right cone generally congruent with said interior wall portion, said plurality of segments being resiliently inwardly compressible for inserting said member into said receptacle to be held rotatably in captive relation therein, said connective adapter member further including an internally threaded opening therethrough in alignment with said abutment surface for receiving said stud during assembly of the bus bar with the transformer stud, said adapter member being rotatable during such assembly for relative axial movement along the stud until the stud engages said abutment surface and forces the flaring surfaces of said segments against said tapering wall surfaces.

4,141,620
LIGHT DEFLECTING DEVICE USING A POLYGON MIRROR WITH FLOAT MEMBERS

Takeshi Goshima, Tokyo, and Shoji Ohta, Funabashi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,631
Claims priority, application Japan, Nov. 9, 1976, 51-134586
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—6.8 22 Claims



1. A light deflecting device having a polygon mirror, comprising:

a polygon mirror member having a reference surface and a plurality of integral mirrored surfaces formed at a predetermined angle with respect to said reference surface;

a fixing member for resiliently fixing said polygon mirror member to a drive shaft for rotatively driving said polygon mirror member, said fixing member being effective to vary the angle formed between said reference surface and said drive shaft; and

a plurality of float members opposed to said reference surface of said polygon mirror member and fixed independently of the rotation of said polygon mirror member, said float members being effective to produce a flow of air between said reference surface and said float members during rotation of said polygon mirror member to maintain a predetermined distance therebetween.

4,141,621
THREE LAYER WAVEGUIDE FOR THIN FILM LENS FABRICATION

Roger L. Aagard, Richfield, and Robert P. Ulmer, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 5, 1977, Ser. No. 822,116
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.12 9 Claims

1. A thin film lens fabricated in a layered optical waveguide comprising:

a multilayer optical waveguides comprising a first thin flim layer of (X_2O_5) on a substrate, an intermediate thin of titanium dioxide (TiO_2) thereon, and a second thin film layer of (X_2O_5) over the TiO_2, wherein X is an element selected from the group consisting of niobium and tantalum, the three layers together defining a waveguide, and the extremities of the first and second layers of (X_2O_5) providing a top and bottom boundary of the waveguide whereby a wave is propagated by reflection between said top and bottom boundaries; and

a step-in-thickness lens in said waveguide formed by plasma etching away the desired lens shape in said second (X_2O_5) layer, said TiO_2 operating as an etch stop during etch to provide a flat bottom for said etching away lens and, therefore, provide a flat top boundary for said lens formed by said remaining first and intermediate layer, whereby in said lens area the wave is propagated by reflection between said lens top boundary and said bottom boundary.

4,141,622
OPTICAL GUIDES WITH FLEXIBLE CENTRAL REINFORCING MEMBERS

Richard E. Beal, Wigan, England, assignor to BICC Limited, London, England

Continuation of Ser. No. 482,993, Jun. 25, 1974, Pat. No. 4,037,923. This application Mar. 14, 1977, Ser. No. 777,119
Claims priority, application United Kingdom, Jun. 28, 1973, 30856/73
The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.23 8 Claims

1. An optical cable comprising a longitudinally extending flexible central reinforcing member, a layer of compressible material surrounding the central reinforcing member, a plurality of separate optical fibres stranded side by side about the central reinforcing member in such a way that each optical fibre is in contact with the layer of compressible material and, surrounding the optical fibres, an outer protective sheath, the arrangement being such that when the separate optical fibres

are subjected to a tensile force at least some of the optical fibres can move transversely inwardly of the cable to compress the

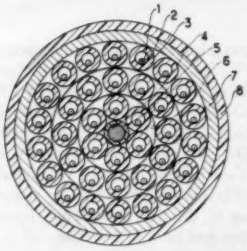
compressible material and thereby reduce the strain that would otherwise be imparted to the fibres.

4,141,623

OPTICAL FIBRE CABLE AND A METHOD OF MANUFACTURE

René Dubost, Faverges de la Tour, and Bernard Grenat, La Mulatiere, both of France, assignors to Societe Anonyme dite: Les Cables de Lyon, Lyons, France

Filed May 13, 1977, Ser. No. 796,815
Claims priority, application France, May 21, 1976, 76 15421
Int. Cl.[2] G02B *5/16*; B65H *81/00*
U.S. Cl. 350—96.23 **8 Claims**



1. A cable of optical fibers which can be used separately for signal transmission, said cable comprising: a central core; a bundle of optical fibers disposed concentrically around said core, said fibers having a diameter of about 100 microns and being covered with a first protective layer made of a first plastic material exhibiting a high modulus of elasticity and applied on the fiber with a clearance of a few microns; a second protective layer formed by extrusion of a second plastic material defining a tubular shaped protective layer formed about said first protective layer and having between them a clearance of a few tenths of a millimeter, said second plastic material having a lower melting point and a lower modulus of elasticity than that of said first plastic material; said optical fibers covered with their respective protective layers being assembled in concentric layers with longitudinal tension to exceed an elastic limit of said second plastic material while not that of said first material; such second protective layer being formed by extrusion at a temperature inhibiting softening of said first sheath; a sheath of an electrically conductive metal surrounding said outer concentric layer of optical fibers; and an outer sheath of plastic material.

4,141,624

DYNAMIC IMAGE ENHANCEMENT FOR FIBERSCOPES

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

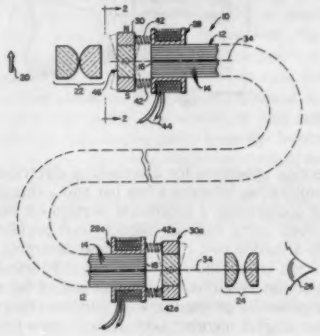
Filed Nov. 21, 1977, Ser. No. 853,060
Int. Cl.[2] G02B *5/17*
U.S. Cl. 350—96.26 **6 Claims**

1. A dynamic image enhancement system for a bundle of optical fibers having image receiving and image emitting opposite end faces, said system comprising:

an alternating current solenoid adjacent each of said opposite end faces of said bundle;

a pivotable permanent magnet in spaced juxtaposition with each of said solenoids, said magnets each having transverse north and south pole magnetization and a pivot axis extending perpendicularly to the direction of said magnetization;

means for supporting and permitting pivoting of each of said magnets about said pivot axis; and



a plane parallel transmitting plate affixed to each of said magnets between respective poles thereof; whereby

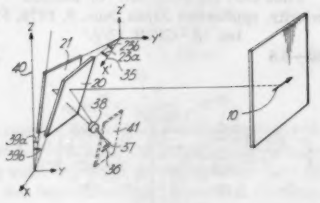
simultaneous electrical alternating current energization of said solenoids will produce harmonic back and forth pivoting oscillation of said magnets and the corresponding image transmitting plates with enhancement of images focused upon said image receiving face of said bundle of fibers through its adjacent transmitting plate and viewed upon said image emitting face of said bundle through its adjacent transmitting plate.

4,141,625

OPTICAL SYSTEM FOR MULTIPLE IMAGING A LINEAR OBJECT

Kenneth A. Pickar, Kanata, and John S. S. Wei, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal,, Canada

Filed Nov. 28, 1977, Ser. No. 855,356
Int. Cl.[2] G02B *27/14*
U.S. Cl. 350—171 **1 Claim**



1. An optical system for multiple imaging of a linear object, comprising:-

a plurality of mirrors positioned in a stacked relationship facing towards an object, each mirror having a predetermined optical transmission characteristic, being a maximum at the front mirror and a minimum at the rear mirror;

each mirror tilted about a first axis and rotated about a second axis, said first axis parallel to the axis of the linear object and the second axis normal to the first axis, the first and second axes in a plane normal to the axis of the light

path from said object to said mirrors, said mirrors tilted and rotated progressively from the front mirror;

an image array laterally displaced from the axis of the light path between the object and the mirrors; and

a lens structure positioned between the mirrors and the image array;

whereby a multiplicity of images are reflected on to said image array, an image from each mirror, said images laterally and longitudinally displaced, a different section of each image in a contiguous side by side position.

4,141,626

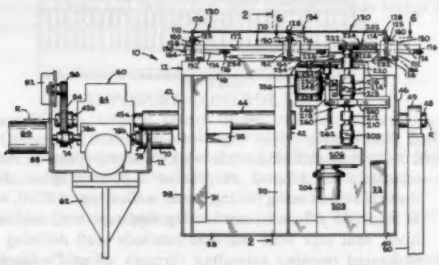
METHOD OF AND APPARATUS FOR COLLECTING SOLAR RADIATION UTILIZING VARIABLE CURVATURE CYLINDRICAL REFLECTORS

William J. Treytl, San Jose; Arthur J. Slemmons, Los Gatos, and Gerry B. Andeen, Menlo Park, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 31, 1977, Ser. No. 801,671

Int. Cl.[2] G02B *5/10*; F24J *3/02*

U.S. Cl. 350—295 **11 Claims**



1. An apparatus for concentrating solar radiation into an elongate aperture of an elongate solar receiver comprising: a first frame; a second frame mounted to said first frame for rotation about a single fixed axis, said first frame being oriented such that said fixed axis of rotation of said second frame is parallel to the elongate aperture of an elongate solar receiver; means defining a flexible, rectangular reflecting surface; resilient means for mounting said reflecting surface means to said second frame such that said reflecting surface means is parallel to said axis of rotation; means for rotating said second frame to change the inclination angle of the reflecting surface means and to thereby track the sun during the apparent diurnal movement of the sun; and means, operatively connected to said resilient mounting means, for bending said reflecting surface means into a cylindrical trough having a variable curvature in a plane normal to said axis of rotation, said bending means including motor driven means for changing said curvature substantially simultaneously with the rotation of said second frame to accurately focus incident solar radiation into said aperture of the receiver at the various inclination angles of the reflecting surface means and at the various off-axis angles of the incident solar radiation relative to a plane which is normal to said fixed axis of rotation of the member.

4,141,627

ELECTRO-OPTIC DEVICE

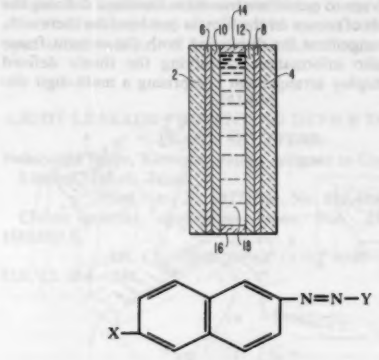
Allen Bloom, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 6, 1977, Ser. No. 757,374

Int. Cl.[2] C09K *3/34*; C02F *1/13*

U.S. Cl. 350—349 **5 Claims**

1. In an electro-optic device comprising a nematic liquid crystal composition having a positive dielectric anisotropy between two electrodes, the improvement wherein said nematic liquid crystal composition contains a dye of the formula



wherein X can be hydrogen, alkyl, alkoxy, cyano, nitro, dialkylamino, halogen or —N=N—Y and Y can be phenyl, phenyl substituted in the para position with an alkyl, alkoxy, cyano, nitro, dialkylamino or halogen group, or a heterocyclic ring.

4,141,628

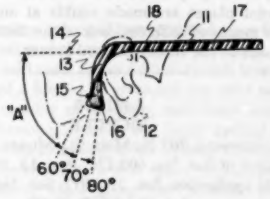
EYEGLASSES TEMPLE CONSTRUCTION

Jacob E. Cloessner, Jr., 17012 General Pickett, Baton Rouge, La. 70816

Filed Apr. 11, 1977, Ser. No. 786,480

Int. Cl.[2] G02C *5/14*, *1/00*

U.S. Cl. 351—111 **4 Claims**



1. Eyeglasses to be worn by a person having ears which comprises:

(a) a lens frame to which is attached lenses; and

(b) two temple members hingedly attached to each side of said frame, respectively, each of said temples comprising a straight section extending outward and over said person's ear and a rear section attached to said straight section at an angle between 60° and 80° from said straight section, each of said rear sections having a weight embedded therein, each of said weights weighing between $\frac{1}{4}$ and $\frac{3}{4}$ ounces.

4,141,629

INDICATION OF SCENES ON A PROJECTOR PROGRAMMED ON THE BASIS OF SCENES

Gerd Mattes, Schorndorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 896,764

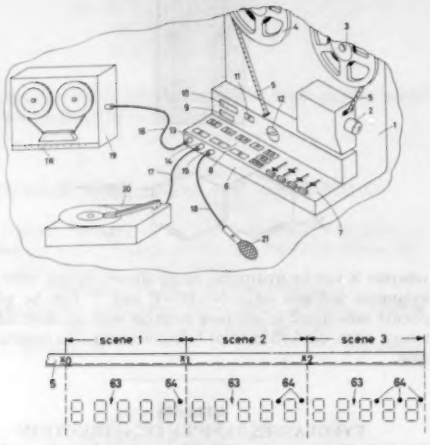
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717688

Int. Cl.[2] G03B *31/02*

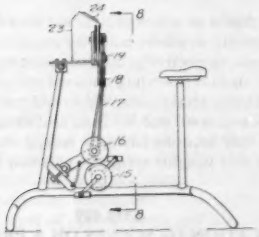
U.S. Cl. 352—27 **8 Claims**

1. In a projector for sound motion-picture film, the projector being of the type provided with film transport means for transporting the film forwards and backwards, frame-counting

means for keeping a running count of the number of the frame being projected at any given time, and operator-activated storage means operative when activated for storing frame counts which are to constitute transition locations defining the starts and ends of scenes on the film, in combination therewith, a display arrangement for displaying both the current frame count and also information identifying the thusly defined scenes, the display arrangement comprising a multi-digit display unit having a plurality of controllable digit zones and a plurality of controllable decimal-point places, and display-control means cooperating with the frame-counting and storage means and operative for controlling the controllable digit zones to effect display of frame counts and controlling which decimal-point places are made visible at any given time to indicate by means of different ones of the decimal-point places different ones of the thusly defined scenes.

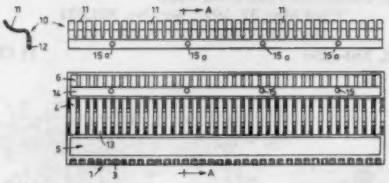


4,141,630
BICYCLE
Conant H. Emmons, 707 N. Main St., Mount Airy, Md. 21771
Continuation of Ser. No. 604,126, Aug. 13, 1975, abandoned.
This application Jan. 21, 1977, Ser. No. 761,136
Int. Cl.[2] G03B *29/00*
U.S. Cl. 352—132 **3 Claims**



1. A photographic device for showing distance lapse motion pictures comprising an exercise bicycle having a driven wheel, a projector being mounted adjacent said exercise bicycle, having a film transport for moving a single frame of film in said projector and mechanical means connecting said driven wheel to said film transport and capable of moving said film a frame at a time in coordination with the rotation of said driven wheel, consisting of a cam being connected to said driven wheel, a driving fork being operatively connected to said cam for being moved back and forth, a gear being connected to said film transport and operatively connected to said driving fork, a spring loaded pin capable of preventing said gear from slipping back when said teeth are disengaged, whereby said pin in one prong will disengage said gear teeth as said gear is rotated by engaging a second prong of said fork.

4,141,631
PHOTOGRAPHIC SLIDE MAGAZINE SPRING ASSEMBLY
Percy Russell, Unit 4, 30A, The Crescent, Dee Why, New South Wales, Australia
Continuation of Ser. No. 608,893, Aug. 29, 1975, abandoned.
This application Dec. 30, 1976, Ser. No. 755,814
Claims priority, application Australia, Sep. 4, 1974, PB8765
Int. Cl.[2] G03B *23/04*
U.S. Cl. 353—116 **3 Claims**

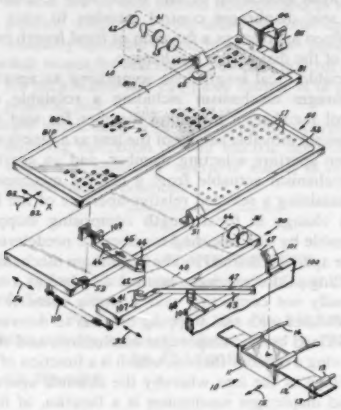


1. A photographic slide magazine comprising
(A) a housing defining a plurality of compartments, each compartment adapted to receive a photographic slide therein, said housing having a rear wall, an open front, and at least one side wall connecting said rear wall and said front, said rear wall and said one side wall defining an elongated opening extending through all said compartments along said one side wall, and said one side wall defining in each of said compartments a recess of given depth communicating with said opening;
(B) a spring finger assembly formed of plastic mounted on said rear wall and having individual spring fingers extending through said opening, each of said individual spring fingers being configured and dimensioned so that the free end thereof is at all times supported by and slidable along the bottom of an associated one of said recesses and an intermediate portion thereof extending into said compartments for engagement by a slide, said recess and finger configuration cooperating to preclude complete flattening out of said individual spring finger by an oversized slide.

4,141,632
PHOTOCOMPOSING MACHINE
Roger E. Mitchell, 1233 Edlin Pl., Minneapolis, Minn. 55416
Filed Apr. 29, 1977, Ser. No. 792,104
Int. Cl.[2] B41B *19/00, 23/00*
U.S. Cl. 354—14 **10 Claims**

1. In a photocomposing machine of the type having a font of characters, a housing, an optical system for imaging individual ones of said characters on a film or other light sensitive material, and means for selecting which of said characters is to be imaged, the improvement which comprises a fiche-like font having first and second planar fields of characters with corresponding characters in the two fields spaced a predetermined distance apart, a font carrying frame connected within said housing for independent and simultaneous movements in two dimensions in the plane in which the font is held, said housing configured to display one of the font fields while the other is aligned in the optical system, and indexing means positioned in said housing in association with the displayed field spaced from

said axis of the optical system according to said predetermined distance, whereby selection of characters with respect to said



indexing means and in said first field simultaneously brings the selected character into said optical axis for printing.

4,141,633

EXPOSURE CONTROL DEVICE

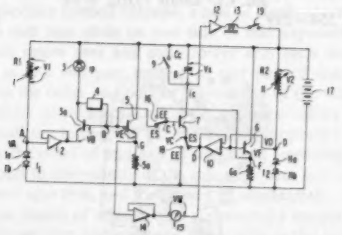
Naoyuki Uno, Urawa; Tetsuji Shono, Saitama; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 643,658, Dec. 23, 1975, abandoned. This application Oct. 26, 1977, Ser. No. 845,746

Claims priority, application Japan, Dec. 26, 1974, 50-3777

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—24 **9 Claims**



1. An exposure control device comprising: (a) an electromagnetic shutter speed control means, (b) an automatic diaphragm opening control means, (c) transducer means exclusively comprising: (1) a first transducer for developing a first voltage dependent upon scene brightness, (2) a second transducer for developing a second voltage dependent upon film speed, and (3) a third, dual purpose transducer for developing a third voltage and adapted to be controlled according to a manual setting of either shutter speed or diaphragm opening to provide said third voltage dependent thereon, and (d) circuit means selectably switchable between an automatic diaphragm opening control (EE) mode and an automatic shutter speed control (ES) mode and responsive to said first, second, and third voltages for developing a diaphragm opening control output when switched to said EE mode or a shutter speed control output when switched to said ES mode and for applying said output to said diaphragm opening control means or said shutter speed control means, respectively.

5. An exposure control device as claimed in claim **1** wherein said first transducer means comprises a photodiode and a log compression transistor having its collector connected to said photodiode, whereby said first voltage is developed across the base-emitter circuit of said log compression transistor, and wherein said second transducer means comprises a variable resistor and a pair of series connected log compression diodes, all connected in series, whereby said second voltage is developed across said pair of log compression diodes.

4,141,634

LIGHT LEAKAGE PREVENTING DEVICE FOR FOCAL PLANE SHUTTERS

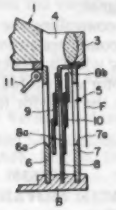
Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,459

Claims priority, application Japan, Nov. 27, 1976, 51-158634[U]

Int. Cl.[2] G03B *19/12, 13/02, 9/40*

U.S. Cl. 354—154 **4 Claims**



1. A light leakage preventing device for focal plane shutters, comprising:

a view finder optical system;

a shutter device arranged to intersect at right angles with said view finder optical system and including therein a front shutter blade group a part of which can advance into said view finder optical system and a rear shutter blade group;

a shielding member arranged between said view finder optical system and said shutter device to prevent a light passing through said view finder optical system from reaching the surface of a film to be arranged just after said shutter device and capable of allowing said front shutter blade group to advance into said view finder optical system;

said shutter device including a first shutter base plate and a partition plate to define a first space for housing therein said front shutter blade group; said partition plate and a second shutter base plate defining a second space for housing said rear shutter blade group; and

said shielding member closely covers the upper part of said second space, said shielding member being formed integrally with said partition plate.

4,141,635

MEANS FOR CONTROLLING FILM DRIVE IN CAMERAS

Seiji Asano, Okegawa, and Tsutomu Hosono, Tokyo, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 28, 1977, Ser. No. 865,254

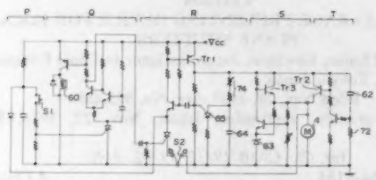
Claims priority, application Japan, Dec. 29, 1976, 51-160051

Int. Cl.[2] G03B *1/12*

U.S. Cl. 354—173 **6 Claims**

1. In a film drive means in a photographic camera adapted to be loaded with a film cartridge of the type having a film feed-out chamber, a film take-up chamber and a bridge portion extending between the chambers, said film drive means comprising a film drive motor for driving a film wind-up mechanism in the camera for winding up the film in the film feed-out chamber onto a film take-up spool in the film take-up chamber; a sensing means for sensing a perforation of the film and generating a signal indicative of the completion of the film feed

when the film has been fed by one frame; a shutter means which generates a signal indicative of the completion of the exposure of the film; and an operating means connected with the sensing means, the shutter means and the film drive motor for operating the drive motor in accordance with the signals given thereto from the sensing means and the shutter means thereby to start the drive motor upon receipt of the exposure



completion signal and stopping the drive motor upon receipt of the film completion signal;

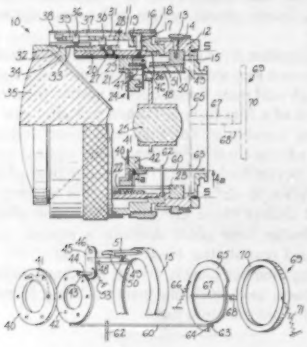
a control means for controlling the operation of said operating means which comprises means for lowering the torque of the drive motor when a predetermined time has passed since the drive motor was started, said predetermined time being longer than the time for feeding the film from one frame to another.

4,141,636

ZOOM LENS WITH MOVABLE DIAPHRAGM

Masatoshi Shimojima, Tokyo, Japan, assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Dec. 15, 1976, Ser. No. 750,828
Claims priority, application Japan, Jan. 20, 1976, 51/4228[U]
Int. Cl.[2] G02B *15/00*
U.S. Cl. 354—196 **15 Claims**



1. In a variable focal length lens comprising an aperture defining diaphragm mechanism including a rotatable diaphragm control member, a mounting member for said diaphragm mechanism movable axially of the lens as a function of focal length, an aperture setting member and an aperture stop down mechanism actuable from a camera mechanism; means for maintaining a selected relative aperture of the lens constant with change in focal length comprising stopping means positionable by said setting member for predetermining the relative aperture defined by the diaphragm mechanism, means connecting said diaphragm control member to a stop member normally not contacting said stopping member but movable into contact with said stopping member to determine the aperture defined by said diaphragm mechanism, said stopping means having a contour thereon which is a function of the focal length range of the lens whereby the absolute aperture defined by said diaphragm mechanism is a function of focal length of the lens upon stop down, and means responsive to said stop down mechanism for actuating said diaphragm control member to cause said stop member to engage said stopping member, said means responsive to said stop down mechanism also being responsive to axial movement of said diaphragm mechanism for actuating said diaphragm control member to vary the diaphragm defined aperture as a function of focal length prior to stop down of the diaphragm mechanism.

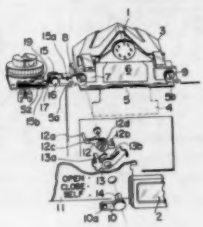
10. In a variable focal length lens comprising an aperture defining diaphragm mechanism including a rotatable diaphragm control member, a mounting member for said diaphragm mechanism movable axially of the lens as a function of focal length, an aperture selecting member, and an aperture stop down mechanism actuable from a camera mechanism; means for maintaining a selected relative aperture of the lens constant with change in focal length comprising stopping means positionable by said selecting member for predetermining the relative aperture defined by the diaphragm mechanism, means connecting said diaphragm control member to a stop member normally not contacting said stopping member but movable into contact with said stopping member to determine the aperture defined by said diaphragm mechanism, said stopping means having a contour thereon which is a function of the focal length range of the lens whereby the absolute aperture defined by said diaphragm mechanism is a function of focal length of the lens upon stop down, and means responsive to the stop down mechanism for actuating said diaphragm control member to cause said stop member to engage said stopping member whereby the aperture defined by said diaphragm mechanism is a function of focal length.

4,141,637

ELECTRICALLY CONTROLLED SELF-TIMER DEVICES FOR SINGLE LENS REFLEX CAMERAS

Toshio Hayashi, Sakai; Hiroshi Ueda, Nara, and Shigeru Oyokota, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1977, Ser. No. 832,616
Claims priority, application Japan, Sep. 28, 1976, 51-116869
Int. Cl.[2] G03B *13/02, 9/64*
U.S. Cl. 354—219 **11 Claims**



1. A single lens reflex camera in which an exposure is controlled in accordance with an electric signal commensurate with the intensity of scene light having passed through the camera objective, said camera comprising:

viewfinder optics including an eye-piece;

light responsive means for generating said electric signal, said light responsive means being disposed to receive extraneous light having passed through said eye-piece;

means for initiating an exposure;

an electrically controlled self-timer for actuating said exposure initiating means after a predetermined time delay from commencement of the operation of said self-timer;

an electric control circuit for initiating the operation of said self-timer;

manually operable means operable from a home position through a first predetermined position to a second predetermined position;

an eye-pice shutter interlocked with said manually operable means and being in an operative position for blocking said

extraneous light to prevent impingement thereof on said light responsive means with said manually operable means in said first or said second position and in an inoperative position withdrawn from said viewfinder optics with said manually operable means in said home position;

switch means for making said electric control circuit operable only when said eye-piece shutter is in said operative position; and

means interlocked with said manually operable means for initiating operation of said electric control circuit only when said manually operable means is in said second predetermined position.

4,141,638

FOCAL PLANE SHUTTER

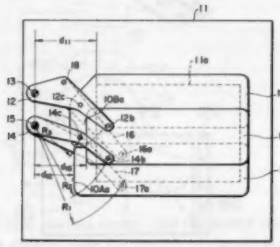
Osamu Ooba, Abiko, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Nov. 3, 1977, Ser. No. 848,528

Claims priority, application Japan, Nov. 11, 1976, 51/135594

Int. Cl.[2] G03B *9/40*

U.S. Cl. 354—246 **3 Claims**



1. A focal plane shutter comprising a base plate having an exposure aperture formed thereon, a pair of shafts secured at a spacing on said base plate on one side of said exposure aperture, a main upper arm and main lower arm each rotatably supported in one end part by one of said pair of shafts and extending in the other end part to the vicinity of the side edge near said shaft of said exposure aperture, an auxiliary upper arm and auxiliary lower arm each rotatably supported in one end part by the other of said pair of shafts and extending in the other end part to the vicinity of the side edge near said shaft of said exposure aperture, and a plurality of substantially rectangular shutter blades of which some are pivotally supported by said main upper arm and auxiliary upper arm in the end edge part near said shaft and the remainder are pivotally supported by said main lower arm and auxiliary lower arm in the end edge part near said shaft between said main upper arm and auxiliary upper arm and said main lower arm and auxiliary lower arm.

4,141,639

LENS BARREL FOR CAMERA

Kiyoji Saito, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,627

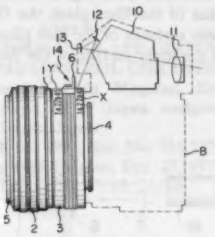
Claims priority, application Japan, Nov. 15, 1976, 51-152059[U]

Int. Cl.[2] G03B *17/20*

U.S. Cl. 354—289 **9 Claims**

1. A lens barrel having an aperture ring, an interlocking pawl on said aperture ring for transmitting the lens-side information to the exposure meter of a camera, said aperture ring being adjacent the camera body when the lens barrel is mounted to the camera, said lens barrel comprising:

an aperture scale usable for display within the camera viewfinder and formed on said aperture ring between said interlocking pawl and that end of said lens barrel which is adjacent to the camera body; and



said interlocking pawl having light transmitting means for passing therethrough light for illuminating said aperture scale for display within the viewfinder.

4,141,640

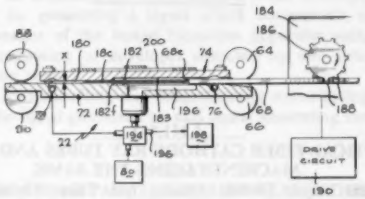
METHOD AND APPARATUS FOR DEVELOPING MICROFILM

William E. Roberts, Palos Verdes Peninsula, Calif., assignor to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Division of Ser. No. 652,635, Jan. 26, 1977, abandoned. This application Apr. 18, 1977, Ser. No. 788,505

Int. Cl.[2] G03D *7/00*; G03B *27/32*; G03C *1/58*

U.S. Cl. 354—300 **6 Claims**



1. In a microfiche developing apparatus which includes a pair of slightly-spaced walls, a seal for sealing a predetermined developing region within said walls, and means for introducing developing fluid into said region, the improvement thereof of a transport for moving a copy sheet to be developed into and out of said developing region, comprising:

a pusher rod formed thin enough to pass between said walls and push the copy sheet in front of it; and

means for moving said rod in a first motion forwardly to a first position wherein the front end of the rod lies within said developing region, to push the copy sheet into the developing region, and then rearwardly to a position wherein said rod front end lies out of said region;

said moving means also constructed to move said rod in a second motion forwardly to a second position which is forward of said first position, to push the copy sheet so that at least a portion of it lies out of said developing region.

4,141,641

OPTICAL FIBER CATHODE RAY TUBES AND COPY MACHINES USING THE SAME

Kiyoshi Nagai; Hitoshi Ikeda, and Takayuki Handa, all of Mitaka, Japan, assignors to Japan Radio Company, Ltd., Tokyo, Japan

Filed Jul. 1, 1977, Ser. No. 812,070

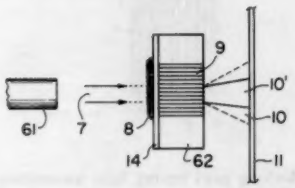
Claims priority, application Japan, Jul. 7, 1976, 51-80484

Int. Cl.[2] G03B *27/00*

U.S. Cl. 355—1 **13 Claims**

1. In an optical fiber cathode ray tube having an optical fiber stack face plate for forming an image at a position spaced from

the outer surface of the face plate comprising a large number of parallel non-lens-like glass fibers of small diameter, each fiber of which is sheathed with a glass having a lower refractive index than that of the fiber glass, the fiber ends forming the inner and outer surfaces of the face plate and phosphor being deposited on the inner surface of the face plate,



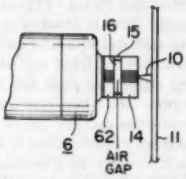
the improvement comprising a light transparent thin layer provided between said phosphor layer and said inner surface of said optical fiber stack face plate, whereby a substantially constant high image resolution is maintained within a distance less than about 0.2mm from the outer surface of the face plate.

4,141,642

OPTICAL FIBER CATHODE RAY TUBES AND COPY MACHINES USING THE SAME

Kiyoshi Nagai; Hiroshi Ohashi, and Takao Ohiwa, all of Mitaka, Japan, assignors to Japan Radio Company, Ltd., Tokyo, Japan

Filed Jul. 1, 1977, Ser. No. 812,160
Claims priority, application Japan, Jul. 7, 1976, 51-80485
Int. Cl.² G03B *27/00*
U.S. Cl. 355—1 **11 Claims**



1. In an optical fiber cathode ray tube having an optical fiber stack face plate comprising a large number of parallel glass fibers of small diameter, the fiber ends forming the inner and outer surfaces of the face plate.

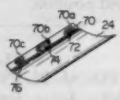
the improvement comprising an additional stack of optical fibers which is disposed facing said face plate of said cathode ray tube, with a light transparent thin layer being interposed between said face plate and said additional stack, said additional stack comprising a large number of parallel optical fibers of small diameter, each of the optical fibers being sheathed by a lower refractive material than the optical fiber, and the fiber ends forming a surface facing said face plate and a surface facing an opposite end.

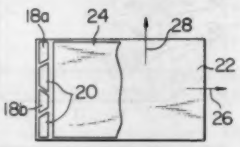
4,141,643

DEVELOPING ELECTRODE ARRANGEMENT FOR ELECTROPHOTOGRAPHIC APPARATUS

Tadahiro Eda; Nobuo Mochizuki, and Yukihiko Nakagawa, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 602,05[illegible], Aug. 5, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,952
Claims priority, application Japan, Sep. 13, 1974, 49/106275
Int. Cl.² G03G *15/00, 15/10*
U.S. Cl. 355—3 DD **22 Claims**





22. An electrophotographic apparatus comprising, in combination;

a developing electrode;

a photoconductive member movable relative and adjacent to the developing electrode;

sensing electrode means disposed upstream of the developing electrode in a direction of movement of the photoconductive member for sensing a voltage on the photoconductive member, said sensing electrode means extending transversely across the width of the photoconductive member, said sensing electrode means having at least one gap along said transverse width;

computing means responsive to the voltage sensed by the sensing electrode and operative to apply a biasing voltage to the developing electrode in dependence thereon; and

auxiliary electrode means disposed in said gap, said computing means being further operative to apply the biasing voltage to the auxiliary electrode means, said auxiliary electrode means being operable in conjunction with said sensing electrode means to preclude streaking by exposing said photoconductive member to substantially uniform voltage across its transverse width.

4,141,644

CORONA DISCHARGE MEANS IN AN IMAGE FORMATION APPARATUS

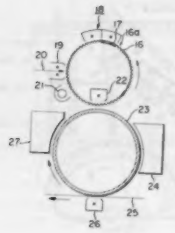
Tadashi Sato, Kokubunji; Akiyoshi Torigai, Machida; Toshirou Kasamura, Kawasaki, and Hidetoshi Tanaka, Musashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

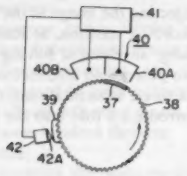
Filed May 4, 1977, Ser. No. 793,851
Claims priority, application Japan, May 21, 1976, 51/58707
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 CH **7 Claims**

1. A corona discharge device for use in an image formation apparatus wherein said device is used in the forming of a primary electrostatic latent image on an image bearing member,

and a secondary image is formed on a recording member by the use of the primary latent image, said image bearing member being mounted on an endless supporting member, the improvement comprising:

a plurality of corona electrode means each of which is independently operable to effect corona discharge to said latent image bearing member, wherein the sum of the





lengths of said corona means and the latent image bearing member is greater than the length of the supporting member, wherein all said lengths are measured in the direction of movement of said latent image bearing member; and

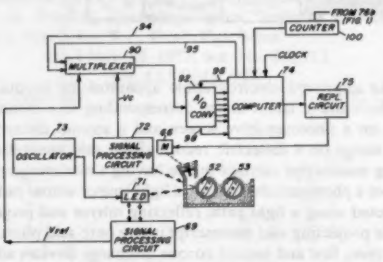
control means for selectively operating all or part of said corona electrode means in accordance with movement of said image bearing member.

4,141,645

TONER CONCENTRATION MONITOR

Michael G. Reid, and Stephen R. Rowell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,270
Int. Cl.² G03G *15/09*
U.S. Cl. 355—3 DD **8 Claims**



1. Apparatus for determining the concentration of toner particles in a developer mixture having toner and carrier particles, comprising:

(a) means for producing a first signal representative of the reflectivity of the developer mixture;

(b) means for producing an offset signal representative of a change in developer mixture reflectivity caused by scumming of the carrier particles; and

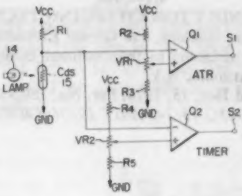
(c) means responsive to said first signal and said offset signal for producing a signal representative of the concentration of toner particles in the developer mixture.

4,141,646

ELECTROPHOTOGRAPHY APPARATUS WITH DOWNTIME CONTROL CIRCUITRY

Ikuo Soma, Yokohama; Tamotu Magome, Kawasaki, and Yutaka Komiya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,177
Claims priority, application Japan, Dec. 27, 1975, 50-156670
Int. Cl.² G03G *15/10, 21/00*
U.S. Cl. 355—10 **31 Claims**



1. An image formation apparatus comprising:

image forming means including means for forming a latent image on a recording member and means for developing the latent image with a liquid developer;

means for detecting the concentration of the developer;

means for generating a signal which corresponds to the downtime of the image formation apparatus using the concentration of developer detected by said detecting means; and

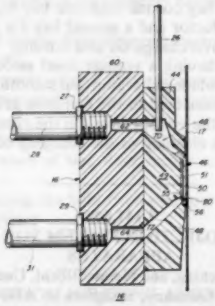
means for controlling said image forming means in response to the signal generated by said signal generating means.

4,141,647

METHOD AND APPARATUS OF APERTURE FLOODING

George D. Lempke, Chicopee, and Nils L. Hakanson, West Springfield, both of Mass., assignors to A.B. Dick/Scott, South Hadley, Mass.

Filed Jun. 2, 1977, Ser. No. 802,827
Int. Cl.² G03D *13/00, 3/08*
U.S. Cl. 355—10 **15 Claims**



1. In a record processor apparatus of the type that can develop a latent electrostatic image area on a film, using a liquid toner, the combination of:

means for holding the film;

a toner module, which defines a small volume chamber with an open side sized to the image area to be developed on the film;

means for moving the film holding means and the toner

module together so that the module opening makes sealing contact about the image area on film held by the holding means to form a chamber; and

means for allowing flow of a small charge of liquid toner to the chamber formed by said toner module and the film, such charge being of a volume such as is required to fill the chamber, means for stopping the flow of the toner and for holding the charge of toner adjacent to the film area for a short period of time sufficient to interrupt the flow of the particles of toner and permit them to migrate to and adhere to the latent image thereon, and means for then removing the liquid toner from the chamber and drying the toner adhering to the image.

4,141,648

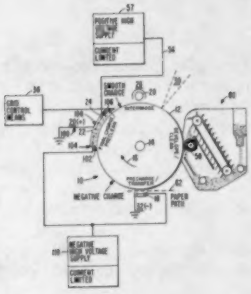
PHOTOCONDUCTOR CHARGING TECHNIQUE

Ronald E. Gaitten, Boulder, and Gerald L. Smith, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,936

Int. Cl.[2] G03G *15/14*; H01T *19/04*; G03G *21/00*

U.S. Cl. 355—14 **13 Claims**



1. In a two cycle process, two corona electrophotographic machine where the photoconductor is being charged, imaged, toned, transferred and cleaned by stations positioned relative to said photoconductor, the improvement comprising in combination:

a combined charging and transfer station for charging the photoconductor and for charging a transfer means; and

a combined overcharging and smoothing station; said station having a dual bay corona with one bay for overcharging the photoconductor and a second bay for smoothing and reducing the overcharge on said corona;

a common grid having a voltage level associated with the bays of the combined charging and smoothing station; and

control means connected to the common grid and operable for switching the voltage level on the common grid so as to perform the cleaning or the charging of the photoconductor.

4,141,649

OPTICAL PROJECTION SYSTEM FOR COPYING APPARATUS

Günther Schnall, Eching, and Hanns Blöchl, Unterhaching, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 823,001

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637514

Int. Cl.[2] G03B *27/48*

U.S. Cl. 355—51 **16 Claims**

1. In a copying apparatus, in combination, means for supporting an original to be copied; means for supporting a recording medium; and projection means operative for projecting light from the original onto the recording medium; and means operative for effecting relative movement between the original and the projection means, the projection means comprising means operative during the relative movement for projecting onto the recording medium a gap-free image of the original by projecting onto the recording medium successive images of successive strip-shaped portions of the original, and including a plurality of optical elements at least two of which are of positive refractive power and operative for projecting an

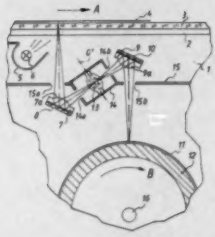


image of a strip-shaped portion of the original into an intermediate image plane and projecting the image in the intermediate image plane onto the recording medium, at least one of the optical elements comprising an element having a lenticular layer of positive refractive power and a reflective layer combined therewith to form a single structural unit, the reflective layer being oriented to introduce a fold into the light path of the projection means.

4,141,650

SHUTTER APPARATUS FOR ELECTROPHOTOGRAPHIC APPARATUS

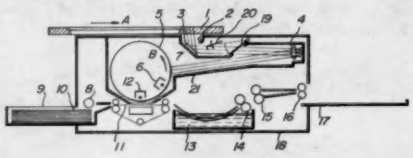
Masaji Nishikawa, and Kiyoshi Miyashita, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 20, 1977, Ser. No. 808,433

Claims priority, application Japan, Jun. 24, 1976, 50/73786

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—35 C **12 Claims**

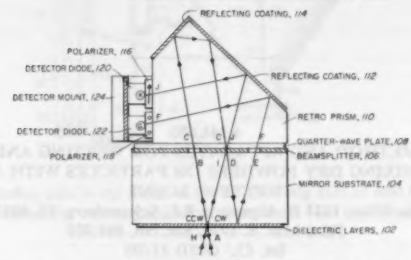


1. An improved electrographic apparatus for producing a first electrostatic latent image corresponding to a manuscript image on a photosensitive screen and a second electrostatic latent image on a dielectric record sheet, said apparatus employing manuscript carriage means having a manuscript placed thereon; a photosensitive screen; a light source whose radiation is directed along a light path; reflecting mirror and projection lens for projecting said manuscript image onto said photosensitive screen; first and second corona discharge devices adapted to direct a flow of corona ions toward said photosensitive screen and through said photosensitive screen toward said dielectric record sheet, respectively, the improvement comprising: a shutter arranged in said light path and interlocked with said manuscript carriage, said shutter being adapted to open only during intervals of time at which said manuscript is scanned to produce said first electrostatic latent image on said photosensitive screen and said shutter being adapted to close during intervals of time at which said second electrostatic latent image is produced on said dielectric record sheet.

4,141,651
LASER GYROSCOPE OUTPUT OPTICS STRUCTURE

Irl W. Smith, Newton, and Terry A. Dorschner, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 10, 1977, Ser. No. 758,223
Int. Cl.[2] G01B 9/02; G01P 9/00
U.S. Cl. 356—350 17 Claims



1. In combination:

a laser gyroscope cavity having a laser gain medium, a polarization dispersive structure for producing waves of at least four frequencies, and a plurality of reflecting means positioned to form a closed path for said waves, at least one of said reflecting means being partially transmitting of waves incident thereon;

a beam splitter;

means for directing the portions of said waves transmitted through said partially transmitting reflecting means directly through a solid dielectric medium to the plane of said beam splitter, said beam splitter producing reflected and transmitted waves;

means for converting said portions of said waves from circular polarization to linear polarization, said converting means being disposed in the paths of said reflected and transmitted waves from said beam splitter;

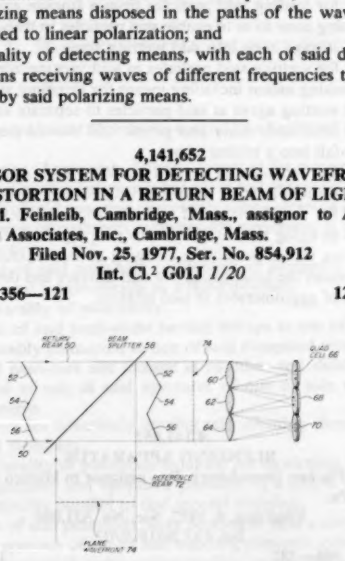
polarizing means disposed in the paths of the waves converted to linear polarization; and

a plurality of detecting means, with each of said detecting means receiving waves of different frequencies transmitted by said polarizing means.

4,141,652
SENSOR SYSTEM FOR DETECTING WAVEFRONT DISTORTION IN A RETURN BEAM OF LIGHT

Julius M. Feinleib, Cambridge, Mass., assignor to Adaptive Optics Associates, Inc., Cambridge, Mass.

Filed Nov. 25, 1977, Ser. No. 854,912
Int. Cl.[2] G01J 1/20
U.S. Cl. 356—121 12 Claims



1. An apparatus for sensing wavefront distortions in a return beam of light from an irradiated or selfilluminated object, comprising, in combination:

a. means for emitting a modulated reference light beam;

b. means for combining said return beam with said modulated reference light beam to form a combined light beam;

c. means for dividing said combined light beam into a plurality of subaperture components;

d. photosensitive means for detecting the position of light beams focused thereon;

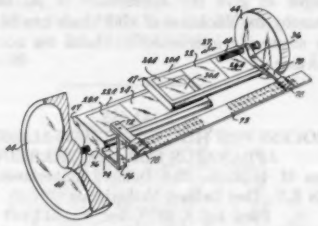
e. means for focusing each of said plurality of subaperture components of said combined light beam onto said photosensitive means for detecting; and

f. electronic means for determining the wavefront tilt of said target return beam from the relative positions of the target-return and modulated reference light beams for each of said plurality of subaperture components.

4,141,653
SPECTROGRAPHIC APPARATUS

Frederick A. Arnold, 1716 30th St., San Diego, Calif. 92102

Filed Feb. 7, 1977, Ser. No. 766,136
Int. Cl.[2] G01J 3/48, 3/46; G02B 5/22; G01J 3/10
U.S. Cl. 356—419 9 Claims



1. A device for the mixing of hues of the light spectrum to provide the correct color to an object comprising:

a light source for producing a light of a selected spectrum;

first and second filter holding means translatable relative to each other;

each of said holding means includes a like scale means for referencing the relative position of said filter holding means after movement from a predetermined position;

said first filter holding means having a first and second filter element positioned in a side-by-side relationship;

said second filter holding means having a third and fourth filter element positioned in a side-by-side relationship;

said first and second filter elements having complementary first colors;

said third and fourth filter elements having complementary second colors;

said filter elements of said first and second holding means being in substantial alignment when positioned one over the other;

said light is directed through at least a portion of a filter element of each of said filter means toward said object; and

means for viewing the light from said source when reflected from said object.

4,141,654
STANDARD FOR CALIBRATING AND/OR VERIFYING INSTRUMENT ACCURACY

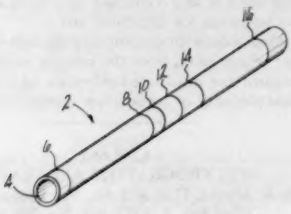
Stephen C. Wardlaw, Branford, and Robert A. Levine, Guilford, both of Conn., assignors to James V. Massey, III, Trumbull, Conn., a part interest

Filed May 23, 1977, Ser. No. 799,178
Int. Cl.[2] G02B 27/32; G01C 25/00
U.S. Cl. 356—243 1 Claim

1. A device for checking the accuracy with which a blood constituent concentration measuring instrument is operating, said device comprising:

(a) a capillary tube size member; and

(b) a plurality of differentially colored bands painted on said member with fluorescent paint, the boundaries of said bands defining a plurality of circumferentially extending lines visible from the outside of said member and spaced apart from each other axially of said member, said bands corresponding in thickness to the thickness of different



physically elongated layers of centrifuged blood constituents having known concentrations in a centrifuged blood sample to give the appearance of an actual sample, whereby the thickness of said bands can be measured in the measuring instrument to check the accuracy of the instrument.

4,141,655

PROCESS FOR HOMOGENIZING MASSES AND APPARATUS FOR USE THEREIN

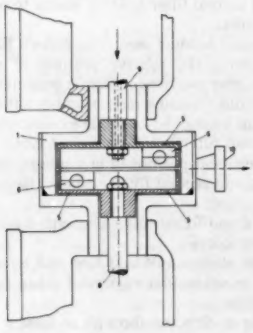
Johannes H. te Riele, Den Dolder, Netherlands, assignor to Remia B.V., Den Dolder, Netherlands

Filed Jul. 5, 1977, Ser. No. 812,649

Claims priority, application Netherlands, Jul. 7, 1976, 7607527

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—118 **3 Claims**



1. Apparatus for homogenizing a mass containing at least two substances at least one of which comprises a fluid, comprising

(a) a housing containing a homogenizing chamber, inlet means for supplying the substances into the chamber to define a mass to be homogenized, and outlet means for discharging the mass from the chamber;

(b) at least one first vibratory blade arranged in said chamber to extend within the mass to be homogenized;

(c) means including a rotary shaft for rotating said first blade about an axis generally parallel therewith and spaced therefrom to effect vibration of said first blade in the mass; and

(d) brake means arranged in said chamber and extending normal to the axis of rotation of said first blade for braking the mass against rotation by said first blade, whereby the mass in the chamber is homogenized by said first blade prior to discharge via said outlet means, said brake means including

(1) a second vibratory blade arranged in said chamber to extend into the mass on the opposite side thereof from said first blade, and

(2) means including a second rotary shaft for rotating said second blade about an axis generally parallel with the axis of rotation of said first blade.

4,141,656

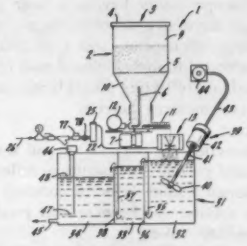
METHOD AND APPARATUS FOR WETTING AND MIXING DRY POWDERS OR PARTICLES WITH A WETTING AGENT

Tuaha Mian, 1224 E. Algonquin Rd., Schaumburg, Ill. 60195

Filed Mar. 6, 1978, Ser. No. 884,002

Int. Cl.[2] G05D *11/00*

U.S. Cl. 366—160 **10 Claims**



1. In a apparatus for mixing solid dry particles with a wetting agent, the combination of:

means for feeding said particles from a storage zone into a wetting zone so as to enable said particles to free-fall from said storage zone into said wetting zone;

means for wetting said particles in said wetting zone,

said wetting means including means for directing streams of said wetting agent at said particles to separate said particles from each other and permit said wetted particles to free-fall into a mixing zone;

means for mixing said wetted particles with said wetting agent into a mixture in said mixing zone;

means for transferring said mixture from said mixing zone into an aging zone and then into a supply zone, said transferring means permitting an aging of said mixture which increases the homogeneity of said mixture and the dissolution of agglomerates in said mixture.

4,141,657

BLENDING APPARATUS

John J. Fischer, Stroudsburg, Pa., assignor to Harsco Corporation, Pa.

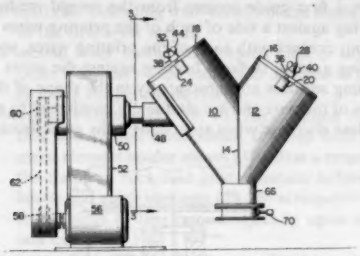
Filed Sep. 1, 1977, Ser. No. 831,096

Int. Cl.[2] B01F *9/02*

U.S. Cl. 366—232 **17 Claims**

1. A blending apparatus comprising a material container including a pair of hollow mixing legs joined together at one end along a common plane to form an apex portion, said hollow legs being divergent from said common plane along intersecting axes each of which forms an acute angle with said

common plane, one of said legs being greater in length than the other leg, means for mounting said container for rotation about



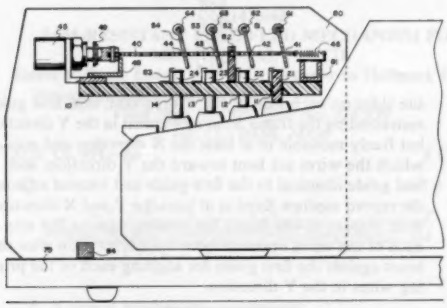
a rotation axis in the plane of the intersecting axes of said legs, and means for rotating said container about said rotation axis.

4,141,658

ATTACHMENT FOR REMOTE CONTROL OF A KEYBOARD

Tom L. Ricca, 1407 Wyandotte Rd., Columbus, Ohio 43212

Filed Jun. 29, 1977, Ser. No. 811,061
Int. Cl.[2] B41J *5/00*
U.S. Cl. 400—70 **15 Claims**



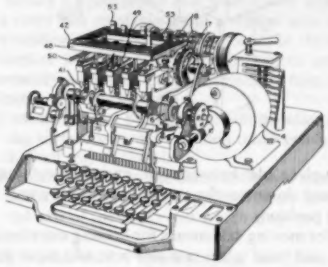
1. An attachment for remote control of a keyboard comprising:
   a. a series of selecting elements mounted for movement in a first direction between inoperative and operative positions
   b. each of said selecting elements having a series of apertures
   c. a series of push-bars mounted for movement in a second direction
   d. each of said push-bars comprising an elongated member oriented longitudinally in a third direction
   e. a plurality of push-sticks
   f. each of said push-sticks having linkage at one of its ends rotatably connected to one of said elongated members of said push-bars and linkage at its other end slidably confined in one of said apertures of one of side selecting elements
   g. means for selectively moving said selecting elements and said push-bars
   h. a plurality of push-rods mounted for movement between inoperative and operative positions in a fourth direction preferably parallel to said second direction.
   i. each of said push-rods being positioned near a corresponding aperture of one of said selecting elements, corresponding push-stick and a corresponding key of said keyboard
   j. each individual push-rod having means for linking a first one of its surfaces to a particular surface of said corresponding key and causing said key to move in a fifth direction preferably parallel to said fourth direction from inoperative position to operative position when said individual push-rod is moved from inoperative position to operative position respectively
   k. said individual push-rod having a second surface opposite to said first surface acted upon by said slidable end of said corresponding push-stick in the direction that causes in turn said corresponding key to move in the direction from inoperative position to operative position only when the selecting element slidably linked to said corresponding push-stick was first selectively moved to operative position and then the push-bar rotatably linked to said corresponding push-stick was next selectively moved to operative position.
   l. whereby selectively moving said selecting elements and said push-bars selectively moves said keys of said keyboard from inoperative position to operative position and actuates consequently the functions intended for said keys.

4,141,659

BOWDEN WIRE SUBSTITUTE MECHANISM

Berthel F. Madsen, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1940, Ser. No. 317,458
Int. Cl.[2] B41J *7/66*
U.S. Cl. 400—90 **8 Claims**



3. A ciphering unit, comprising a plurality of variable random circuits, a plurality of juxtaposed like mechanisms to change said circuits, each said mechanism being conditionable for operation or non-operation, means to condition each said mechanism for operation or for non-operation, each said conditioning means including a member having two functioning positions, a plurality of rectangular bails mounted one inside the other for rocking movement about a common horizontal axis, means in each said mechanism to rock a respective said bail, and adjustable means carried by each said bail to operate a respective said member whereby to condition for operation a mechanism that is conditioned for non-operation at the time such member is operated.

4,141,660

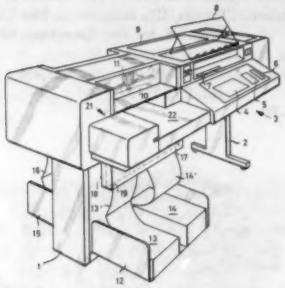
PRINTER FOR DATA-PROCESSING MACHINE HAVING SINGLE OPERATOR STATION

Hans Bommersheim, Brigachtal; Bernhard Hettich, Villingen-Schwenningen; Helmut Keller, Geisingen; Werner Moser, and Klaus Tauchert, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Continuation of Ser. No. 666,231, Mar. 12, 1976, abandoned.
This application Nov. 21, 1977, Ser. No. 853,573
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2511983
Int. Cl.[2] B41J *11/26, 11/58, 29/48*
U.S. Cl. 400—124 **7 Claims**

1. A data-processing machine comprising:
   a stand having a front side and a back side;
   an operator station on said stand at said front side;

an input keyboard at said operator station;
data-processing hardware in said stand coupled to said keyboard;
a band supply holder on said front side next to said station for holding a form band;
a band support on said stand next to said station and above said band holder and having an upwardly convex surface;
a band receptacle on said back side of said stand below said band support;
guide means for transporting said band up from said supply holder over said surface and down to said band receptacle, said guide means having not more than a single transport device engaging said band, said transport device arranged between said surface and said receptacle, said guide means also including a guide slot between said surface and said holder and provided with means for braking said band as it is transported to said surface, said guide slot being dis-



place-placeable between an upright working position directed downwardly at said band supply and a pivoted input position;
means for moving said means for braking out of engagement with said band when said slot is in said input position;
a card support on said front side of said stand next to said station and adjacent said band support for supporting a magnetic card;
feed means next to said station at said card support for feeding said card through said stand to said back side, whereby data can be entered on said cards; and
printing means operable by said keyboard and by said hardware and including a horizontally displaceable printing head disposed above said support having vertically displaceable printing elements engageable vertically with a band guided over said support for printing on such band at said support.

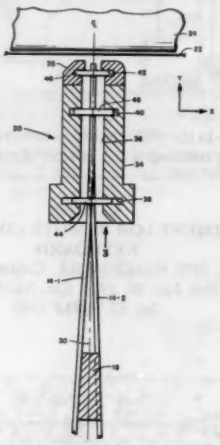
4,141,661

GUIDE SYSTEM FOR WIRE MATRIX PRINTING

David G. Geis, Chicago, and Ingard B. Hodne, Northbrook, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Jul. 18, 1977, Ser. No. 816,824
Int. Cl.[2] B41J *3/12*
U.S. Cl. 400—124 **3 Claims**

1. In a mechanical dot matrix printer in which printing wires are moved relative to a record medium for mechanically marking indicia thereon, a printing mechanism for printing indicia in an X direction comprising: means for moving the printing wires in a direction nearly in a Y direction perpendicular to the X direction for marking indicia on the record medium, said wires in the vicinity of the record medium being arranged seriatim in a Z orientation perpendicular to the X and Y directions, and means for guiding the wires in paths each having a slight angle to the Y direction and generally toward the record medium; an improved alignment arrangement for guiding the wires from their paths at an angle to the Y direction into paths substantially in the Y direction in the vicinity of the record medium comprising:
a frame firmly attached to the printing mechanism;
at least a first guide remote from the record medium for bearing against a side of each of the printing wires and in sliding contact with each of the printing wires, and containing guiding surfaces bearing against the wires which guiding surfaces are substantially in the shape of the surfaces of the wire and are alternately misaligned to accommodate alternate wires approaching the guide from oppo-



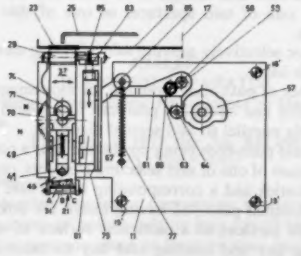
site sides on each side of the Y direction, said first guide restrained by the frame from movement in the Y direction but freely movable in at least the X direction and around which the wires are bent toward the Y direction; and
a final guide identical to the first guide and located adjacent the record medium fixed in at least the Y and X directions with respect to the frame for bearing against the side of each of the wires opposite from the side of each wire that bears against the first guide for aligning each of the printing wires in the Y direction.

4,141,662

RECORDING RIBBON MECHANISM FOR INSTRUMENT RECORDERS

Peter Hepper, Au, and Willy Steiner, Richterswil, both of Switzerland, assignors to Elmes Staub & Co., AG, Richterswil, Switzerland

Filed Feb. 10, 1977, Ser. No. 767,460
Claims priority, application Switzerland, Mar. 9, 1976, 2926/76
Int. Cl.[2] B41J *33/10*
U.S. Cl. 400—194 **8 Claims**



1. In an instrument recorder, a recording ribbon mechanism

to move an endless loop recording ribbon (21) to make a record on recording paper means, upon rotation of the cam disk by the drive motor, being subjected to rocking motion;

a shaft (68) extending transversely of the frame and coupled to the first lever means;

a second lever means (69) located closely adjacent to the other side wall of the frame and coupled to the shaft (68) to move conjointly therewith;

coupling elements (71, 73; 74, 75) coupling the respective first and second lever means (67, 69) with a respective guide element holder means (37, 39) at a respective side of the frame to rock said guide element holder means and hence said guide elements (29, 35) at respectively opposite lateral sides of the frame conjointly upon movement of said cam disk (57);

a rachet slider (81) coupled to one of said lever means (67) to reciprocate upon rocking movement of the lever means;

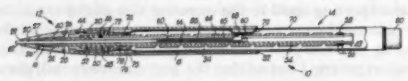
and a ratchet pawl (83) — ratchet wheel (85) arrangement coupling the ratchet slider (81) to said roller (29) to thereby effect rotation of said roller (29) in one direction only upon reciprocating movement of the ratchet slider and effect longitudinal feed of the ribbon at the same time that said ribbon is moved by said guide means (29, 35) transversely to its length.

4,141,663

JAM-RESISTANT LEAD FEED MECHANISM FOR MECHANICAL PENCIL

David F. Reed, Kansas City, Mo., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Mar. 7, 1977, Ser. No. 774,939
Int. Cl.[2] B43K *24/06*
U.S. Cl. 401—68 **6 Claims**



1. A pencil mechanism, comprising:

a tip having a lead emergence end and a connection end and a generally axial bore therethrough;

a tubular element located with one end thereof adjacent said connection end and extending generally axially therefrom,

a portion of said element being tapered in a direction approaching said one end;

structure located at least in part within said element and including an axially bored lead guide having the bore thereof in substantial registry with said tip bore,

the respective bores of said tip and lead guide being configured and arranged to cooperatively present a substantially smooth and uninterrupted lead path for said mechanism;

means connecting said tip and said lead guide, said connecting means comprising corresponding threads on said tip bore and one end of said lead guide, said one end of the guide being threaded into said tip bore,

means for rigidifying said structure within said element including a resilient member mounted on said structure and in engagement with said tapered portion of the element whereby to hold said structure stationary relative to said element and to bias said one end of the element against said tip, while at the same time permitting said corresponding threads to be fully mated such that no discontinuities are present along said path at the interface between said tip and said lead guide; and

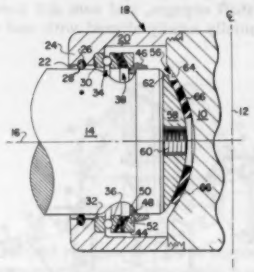
means for moving a lead segment along the length of said path as desired.

4,141,664

ROTARY BLADE RETENTION SYSTEM

Michael W. Moran, McKean Township, Erie County, and Lawrence A. Bergman, Erie, both of Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 597,105, Jul. 18, 1975, abandoned. This application Jun. 2, 1977, Ser. No. 802,843
Int. Cl.[2] F16D *3/00*
U.S. Cl. 403—53 **9 Claims**



1. A rotary blade retention system for mounting at least one blade having a longitudinal axis, said system comprising:

(a) a rotor hub rotatable about a central axis; and

(b) retention means coupling the blade to the rotor hub for rotation with the hub about its central axis, the blade normally extending generally radially from the hub, said retention means including:

(i) means carried by the rotor hub defining a first mounting surface which is oriented transversely to the longitudinal axis of the blade,

(ii) means carried by the blade defining a second mounting surface which is oriented transversely to the longitudinal axis of the blade and which is spaced from the first mounting surface,

(iii) an antifriction thrust bearing, and

(iv) at least one laminated elastomeric bearing having a plurality of layers of rigid and elastomeric material which alternate lengthwise of the blade and which are inclined relative to the longitudinal axis of the blade,

the antifriction bearing and the laminated elastomeric bearing being coupled together in series and mounted between the first and second mounting surfaces such that when a centrifugal load is imposed on the blade the antifriction bearing and the elastomeric bearing are loaded in compression and cooperate to restrain the blade against the centrifugal load, the antifriction bearing freely permitting pivotal movement of the blade about its longitudinal axis and the layers of the laminated elastomeric bearing being inclined to define an effective elastic center located along the blade radially outward of both the antifriction bearing and the elastomeric bearing relative to the rotor hub, the laminated elastomeric bearing being mounted between the antifriction bearing and one of said first and second mounting surfaces such that pivotal movements of the blade which occur during rotation of the rotor hub and relative to the hub about axes transverse to the longitudinal axis of the blade cause deflection of the elastomeric layers of the laminated elastomeric bearing.

4,141,665

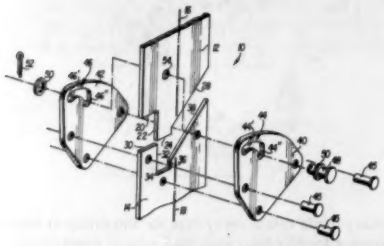
LOCKABLE JOINT FOR ARTICULATED MEMBERS

Edward A. Snapp, Jr., P.O. Box 295, Columbus, Miss. 39701

Filed Sep. 14, 1977, Ser. No. 833,053
Int. Cl.[2] F16C *11/00*; F16D *1/12*
U.S. Cl. 403—100 **13 Claims**

1. A lockable joint for articulated members comprising first and second members having ends, said members being articulatable relative to each other between a locked position with said

members axially aligned and an unlocked position with said members angularly offset from said axially aligned and locked position, nesting means arranged adjacent the ends of said members for preventing relative angular articulation of said members when in said locked position and means carried by said members and responsive to a force applied substantially axially to at least one of said members for angularly articulating said members relatively of one another between said unlocked and said locked positions, said angular articulation means comprising a shaft carried by one of said members and a cam slot carried by the other of said members and in which cam slot said shaft engages, said cam slot comprising a first portion substantially axially aligned with said other member



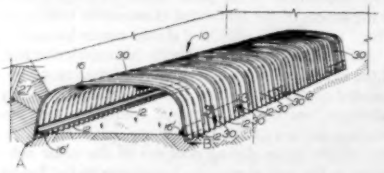
and a second portion intersecting said first cam slot portion, said second cam slot portion emanating from a point transversely and axially offset from the intersection between said first and said second cam slot portions such that, upon application of an axial force to at least one of said members, said shaft engages said second cam slot portion and causes relative angular articulation of said members, said cam slot portions and shaft being located and arranged such that said shaft is positioned at the intersection between said first and second cam slot portions when said members are initially articulated to an axially aligned position, whereby continued application of said axial force is operative to move said shaft relatively of said first cam slot portion and urge said members into said locked position.

4,141,666

LOW HEADROOM CULVERT

Clifford A. DeGraff, Bedford, Ind., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 16, 1978, Ser. No. 878,496
Int. Cl.[2] F16L *9/00*
U.S. Cl. 405—126 **5 Claims**



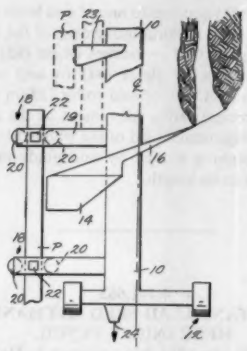
1. A bottomless culvert structure of the type described comprising the combination of a plurality of relatively shallow arch-shaped corrugated culvert sections overlappingly secured to each other at their edges to form an elongated low headroom culvert, elongated extruded unitary hollow stiffener stringer elements disposed in generally spaced parallel relation to each other and secured to the inside surfaces of said arch-shaped culvert sections, said stringer elements extending for substantially the full length of the culvert and integrating said culvert sections one with another to form a unitary culvert structure, certain of said stringer elements also being located a selected distance inwardly from the bottom end edges of said culvert sections to provide elongated footings and soil supports for said culvert and said stringer elements comprising hollow box beams provided with an outwardly rounded body portion and feet depending therefrom for engaging the corrugated culvert sections.

4,141,667

UNDERWATER PIPELINE LAYING METHOD AND APPARATUS

Robert J. Brown, The Hague, Netherlands, assignor to R. J. Brown and Associates AG, Zug, Switzerland

Filed Oct. 11, 1977, Ser. No. 841,586
Int. Cl.[2] F16L *1/00*; E02F *5/06*
U.S. Cl. 405—161 **21 Claims**



1. A method of laying pipeline in a bed substantially underwater, comprising the steps of

disposing the pipe on the bed along the general line the pipeline will take,

excavating a trench in said bed generally parallel to the pipe by transporting spoil to the opposite side of the trench as the pipe and by excavating sufficient material adjacent the pipe so that the pipe will be supported by the bed after initial excavation but so that the bed ultimately will shear along a shear line under the weight of the pipe so that the pipe will drop into the trench, along with material of the bed above the shear line, and

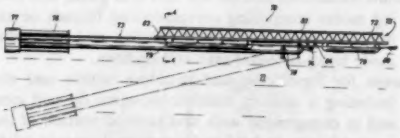
shifting some material that has fallen into the trench, after collapse of the pipe into the trench, out of the trench.

4,141,668

METHOD AND APPARATUS FOR ERECTING A BRIDGE STRUCTURE

David J. Engel, Houston, Tex., assignor to Raymond International, Inc., Houston, Tex.

Filed May 13, 1977, Ser. No. 796,723
Int. Cl.[2] E02B *17/00*
U.S. Cl. 405—202 **32 Claims**



1. A method for erecting a bridge structure above a body of water comprising the steps of:

transporting a prefabricated bridge structure to a location adjacent an existing structure, said prefabricated bridge structure including an elongated horizontal bridge member having at least one extensible support tower pivotably mounted upon said bridge member at a location intermedi-

ate the ends of said bridge member, said support tower being initially disposed in a plane substantially parallel to the longitudinal axis of said bridge member;

pivoting said support tower until it is substantially perpendicular to the longitudinal axis of said bridge member and in a spaced relationship with respect to a surface underlying said body of water;

connecting one end of said bridge member to said existing structure while the support tower is still in a spaced relationship with respect to the surface underlying said body of water;

extending the support tower until it is in contact with the surface underlying said body of water; and

anchoring the support tower to the surface underlying said body of water.

4,141,669

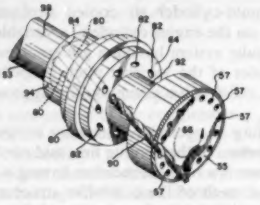
COOLING ARRANGEMENT FOR ROTOR END TURNS OF REVERSE FLOW COOLED DYNAMOELECTRIC MACHINES

William L. Darby, Scotia; Robert H. Monz, and Stephen J. Molis, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 691,360, Jun. 1, 1976, Pat. No. 4,071,790. This application Mar. 3, 1977, Ser. No. 773,799

Int. Cl.[2] B23B *35/00*

U.S. Cl. 408—1 R **2 Claims**



1. In a dynamoelectric machine including a rotor having a reduced diameter spindle, a fan ring formed integrally with the rotor and a turbine coupling fixed to said rotor and spaced axially from said fan ring, the method of forming passages for flow of cooling gas in said fan ring and a portion of said spindle comprising:

(a) locating the positions of inlets for said cooling passages on said fan ring;

(b) positioning a boring tool in engagement with one of said inlet positions with said boring tool disposed in a plane parallel to the axis of the rotor and on a line extending radially outwardly of said turbine coupling;

(c) boring a passage through said fan ring and a portion of said spindle, the alignment of said boring tool obviating any interference with said boring tool by said turbine coupling during such boring operation; and

(d) positioning said boring tool successively in engagement with the remaining inlet portions in similar alignment and repeating the boring operation.

4,141,670

DEVICE FOR EXTRACTING ENERGY FROM WATER WAVES

Robert C. H. Russell, Wallingford, England, assignor to The Secretary of State for Energy, in Her Britannic Majesty's Government of the United Kindgom of Great Britain and Northern Ireland, England

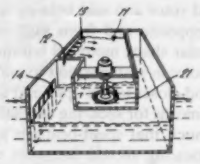
Filed Jun. 2, 1977, Ser. No. 802,908

Claims priority, application United Kingdom, Jun. 9, 1976, 23951/76

Int. Cl.[2] F03D *7/00*

U.S. Cl. 415—2 **9 Claims**

1. A device for extraction of energy from water waves comprising a structure defining at least one high-level reservoir and at least one low-level reservoir, first non-return valve means operative over a vertical extent of the high level reservoir, which first non-return valve means open to permit passage of water into the high-level reservoir but close to prevent passage of water out of the high-level reservoir, second non-return valve means operative over a vertical extent of the low-level reservoir, which second non-return valve means open to permit passage of water out of the low-level reservoir but close to prevent passage of water into the low-level reservoir, the first and the second non-return valve means operating at one vertical position at least partly independently of operation at another vertical position thereby to respond to changes in water pressure across the valve means which occur at different times at different vertical positions up and down the vertical extent of the valve means, and to permit passage of water at one vertical position where the pressure difference across the valve means is in the forward direction while remaining closed or substantially closed at another vertical position where the pressure difference across the valve means is in the return direction and power generating means driven by the flow of water from the high-level reservoir to the low-level reservoir under the pressure head established by the difference in water levels in the respective reservoirs.



4,141,671

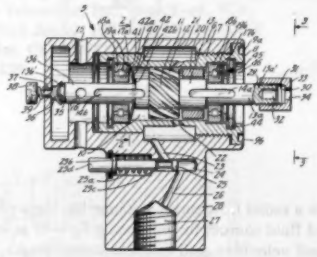
TOOL GAS TURBINE MOTOR

Balazs K. Tarsoly, 52 Maple Pl., Amitville, N.Y. 11701

Filed Apr. 20, 1977, Ser. No. 789,234

Int. Cl.[2] F01D *5/00*

U.S. Cl. 415—72 **2 Claims**



1. A gas turbine motor comprising in combination: a substantially cylindrical stator housing forming therewithin a rotor space and having an open end at at-least one of opposite ends thereof; means for supplying pressurized gas to the housing into said rotor space at substantially one of said opposite ends; a rotor comprising a generally cylindrical member having helically-arranged vanes extending circumscribingly along an outer surface of the cylindrical member along a longitudinal axis thereof and being rotatably disposed inside the housing within the rotor space such that the presurized gas impinges onto the vanes to turn the rotor; gas-directing means for receiving gas supplied and to direct supplied pressurized gas concurrently radially inwardly and axially against said vanes in an axial direction of the longitudinal axis of the cylindrical member; a shaft means extending axially of the rotor along the

longitudinal axis thereof, for engagement by a driven load, the shaft means being mounted drivably at one end thereof to be driven by the rotor and extending outwardly through said open end at said one end; bearing means at opposite ends of said cylindrical member arranged to support the shaft means rotatably within opposite ends of the housing; an annular ring loosely-mounted around said shaft means, between said helically-arranged vanes and said bearing means; said vanes being pitched at a predetermined pitch to cooperate with pressurized gas to be impinged thereagainst; dampening-spring means for resiliently resisting within said space, movement of the rotor axially along its longitudinal axis in a direction away from said open end of said one end, positioned between an enlarged portion of said rotor and said bearing means within said rotor space at an opposite end from said opening; a safety plate means of annular shape mounted within said open end of said one end at a point in juxtaposition to said bearing means at that end thereof and closer to the open end than the bearing means; and retaining means for securing said safety plate means within the housing, such that spent-bearings are trapped within the housing if a bearing should fragment during rotation of the rotor.

4,141,672

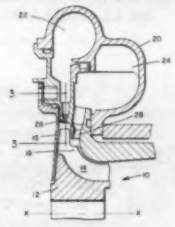
DUAL OR MULTISTREAM TURBINE

Kurt H. Wieland, Rolling Hills Estates; James C. Noe, Canoga Park, and Terence P. Emerson, Redondo Beach, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 572,543, Apr. 28, 1975, abandoned. This application May 5, 1977, Ser. No. 793,992

Int. Cl.[2] F01D *9/06*

U.S. Cl. 415—202 **12 Claims**



1. In a radial flow turbo machine having a plurality of pressurized fluid sources for producing flow of at least two different fluid velocities, said machine comprising:

a housing;

a plurality of chambers in said housing, each chamber being connected to at least one of said sources;

a turbine member having a plurality of blades, said blades being divided into a plurality of sections comprising at least two separate aerodynamic areas positioned axially along each blade, one of said blade areas having a radial dimension greater than that of an other of said blade areas; and

fluid directing means beteen each of said chambers and one of said blade sections for directing fluid from said chambers to said blade sections, fluid from one of said chambers having a greater fluid velocity being directed to said one of said blade areas and fluid from the other of said chambers having a lesser fluid velocity being directed to said other of said blade areas.

4,141,673

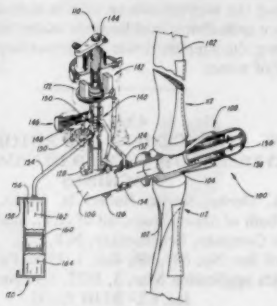
ENGINE DAMPENER MEANS

Eugene C. McCormick, P.O. Box 706, Wellington, Kans. 67152

Continuation of Ser. No. 578,402, May 19, 1975, Pat. No. 4,007,773, which is a division of Ser. No. 469,427, May 13, 1974, Pat. No. 3,926,156. This application Dec. 20, 1976, Ser. No. 752,471

Int. Cl.[2] B64C *11/38*

U.S. Cl. 416—170 R **3 Claims**



1. In a multi-cylinder air cooled airplane engine having cooling fins on the engine cylinders, a variable pitch propeller and a hydraulic system having a governor pump for controlling the blades of the variable pitch propeller, a gear pump assembly, a relief valve assembly, the improvement comprising:

(a) a cooling fin vibration dampener mounted on the outer edge portion of the cooling fins, said cooling fin vibration dampener is a resilient member having a comb-like structure, the teeth of the comb-like structure being inserted between the outer edge portion of the cooling fins, said teeth have a structure defined by tapered and generally pointed outer end portions such that when mounted between said cooling fins said teeth assume an essentially rounded shape;

(b) a propeller dampener mounted on the blades of the variable pitch propeller, said propeller dampener is a resilient member mounted on the leading edge portions of each blade of the variable pitch propeller;

(c) a hydraulic fluid dampener, said hydraulic dampener comprising an accumulator housing having an inlet and an outlet, the outlet end of said accumulator housing includes an oil chamber with oil, said oil chamber situated inside said accumulator housing, the inlet end of said accumulator housing comprises an air chamber positioned inside thereof, a movable piston situated inside said accumulator housing between said oil chamber and said air chamber, an interconnecting conduit that joins the outlet of said gear pump assembly to the inlet of said relief valve assembly, an oil conduit connected with said interconnecting conduit and to said outlet end of said accumulator housing, a pneumatic means in communication with said inlet and said air chamber to maintain said piston in balance against the oil in said oil chamber such that pulsations of said gear pump assembly during operation causes oil in said oil chamber to pulsate thereby oscillating the piston slightly against the force of the air in said air chamber to dampen the pulsations of the oil flow as it is received by the relief valve assembly;

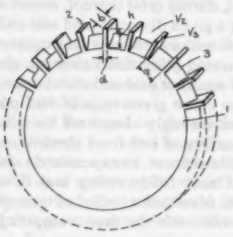
(d) a tuned intake manifold dampener means comprising a looped conduit structure having an inlet in the rear of said engine and interconnecting the intake ports of the engine's cylinders such that all of said intake ports are in communication with each other, a flow balancing conduit interconnecting with said looped conduit such as said looped conduit and said flow balancing conduit define generally a

closed loop, said flow balancing conduit being situated in the front of said engine, said intake manifold additionally includes a plurality of outlet portions in communication with the insides of each cylinder of said engine, each of said outlet portions having a varying cross-sectional area to regulate flow from said intake manifold and provide an essentially uniform manifold pressure at said cylinders.

4,141,674
IMPELLER FOR A RING COMPRESSOR

Siegfried Schönwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 549,781, Feb. 13, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,426
Int. Cl.[2] F01D *5/02*
U.S. Cl. 416—223 A **1 Claim**



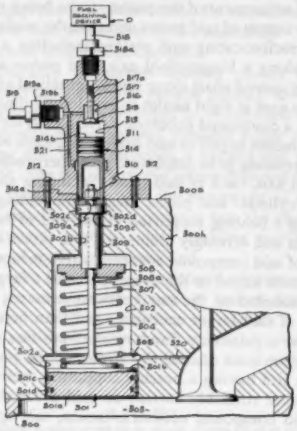
1. In a rotor for a side-channel compressor in which the ratio of the pressure at zero output of the compressor, p_{max}, and the suction pressure of the compressor, p_1, is greater than or equal to 1.79, said rotor including a plurality of spaced-apart blades having cells interposed therebetween, the improvement comprising said blades having a thickness dimension chosen so that the ratio of (a) the blade cell volume to (b) the sum of the blade cell volume and the blade volume is equal to or less than 0.72 and greater than or equal to $0.45/(p_{max}/p_1-1)^2$.

4,141,675
GAS-ACTUATED FUEL PUMP WHEREIN THE PUMP PISTON IS DRIVEN BY A SPRING

Cormac G. O'Neill, Laffayette, Calif., assignor to Physics International Company, San Leandro, Calif.

Continuation-in-part of Ser. No. 642,768, Dec. 22, 1975, Pat. No. 4,098,560. This application Dec. 8, 1977, Ser. No. 858,650
Int. Cl.[2] F04B *17/00, 35/00;* **F16J** *1/10*
U.S. Cl. 417—214 **10 Claims**

1. A fuel pump comprising:
first wall means defining a fuel chamber;
inlet means in communication with said fuel chamber for supplying fuel thereto at a selected first pressure,
outlet means in communication with said fuel chamber and with a fuel-receiving device for facilitating the supply of fuel from said fuel chamber to said device when the latter is in condition to receive fuel; and
control means for increasing the pressure of the fuel in said fuel chamber and for ejecting the fuel therefrom for supply to said device when the latter is in condition to receive fuel, said control means including a first piston having a first end defining one side of said fuel chamber, said first piston being moveable in a first direction whereby the volume of said fuel chamber increases, and in a second direction, opposite said first direction, whereby the fuel chamber volume decreases, and a second piston exposable to a source of gas, said second piston being moveable in said second direction away from said source, movement of said second piston in said second direction being limited to a predetermined maximum distance by a stop means, in response to pressure of the gas from said source, said control means further include spring means for biasing said first and second pistons in said second and first directions, respectively, whereby when said second piston moves in said second direction in response to gas pressure said spring means biases said first piston in said second direction with increased force, to increase the pressure of the fuel in said fuel chamber, so that when said second piston reaches said maximal distance the bias force applied

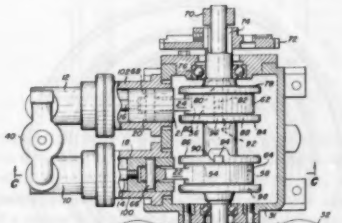


to said first piston in said second direction is a function of only said spring means, said first piston being moveable in said second direction by the bias applied thereto by said spring means to eject fuel from said fuel chamber when said device is in a condition to receive fuel, with said second piston being moveable in said first direction toward said source when the gas pressure therein is below a selected level.

4,141,676
PUMP FOR SOIL FUMIGANT

Robert L. Jannen, Huntsville, and Douglas Johnston, Decatur, both of Ala., assignors to John Blue Company Division of Subscription Television, Inc., New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,902
Int. Cl.[2] H01C *23/02;* **F04B** *25/00*
U.S. Cl. 417—539 **6 Claims**



1. A pump for delivering measured quantities of a solution such as a corrosive fumigant into a hose carrying a stream of anhydrous ammonia under as much as 100 psi pressure leading to applicator knives and sealer means having outlets for injecting the mixture of fumigant and ammonia into the soil, said pump comprising at least one pair of cylinder means to receive the liquid to be measured, said cylinder means having inlet and outlet means for the liquid, and a piston means in each of the

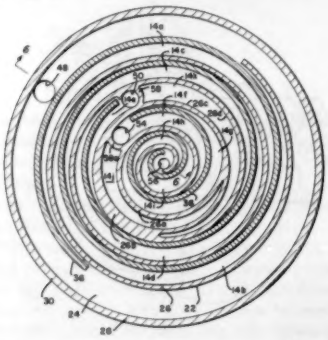
respective cylinders of said at least one pair of cylinder means, drive means for reciprocating said piston means in said cylinder means, said piston means reciprocating through a measured stroke in its cylinder means through pumping and suction strokes to produce said measured stream flow through said outlet, inlet and outlet valve means movably cooperating with said piston and cylinder means, means to adjust the length of said measured pumping and suction strokes of said piston means, said adjustment of the piston stroke being provided for varying the output of said piston and cylinder means, said drive means for reciprocating said pistons including a drive shaft extending along a longitudinal axis, said piston and cylinder means being spaced apart along said longitudinal axis and being disposed on axes at right angles to said longitudinal axis of the drive shaft, a compound eccentric drive means for each one of said piston means keyed to said drive shaft, each of said eccentric means rotating in its respective plane perpendicular to said longitudinal axis, each of said planes including an axis of said respective cylinder and piston means, connecting rod means each having a bearing supported at one end of said eccentric drive means and drivingly connected to a piston on the other end, each of said compound eccentric drive means including a small eccentric keyed to the drive shaft and a larger eccentric rotatably mounted on the small eccentric, means to rotatably adjust one of said larger eccentrics and then hold that larger eccentric in a relatively fixed rotated position around said smaller eccentric to control the stroke of the piston rod and connecting rod having a bearing supported thereon, a stroke transfer spacer rotatably carried on said drive shaft between each of said compound eccentric means, said spacer having side face bearing surfaces thereon disposed perpendicularly to said longitudinal axis, means disposed between said larger eccentrics and said side bearing surfaces to effect simultaneous adjustment of the other of said larger eccentrics in an equal amount as said one eccentric is rotatably adjusted to cause the length of the stroke of the other connecting rod and piston means to be adjusted an equal amount.

4,141,677

SCROLL-TYPE TWO STAGE POSITIVE FLUID-DISPLACEMENT APPARATUS WITH INTERCOOLER

H. William Weaver, and Robert W. Shaffer, both of Campbellsville, Ky., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 15, 1977, Ser. No. 824,749
Int. Cl.[2] F04C *23/00, 17/02*
U.S. Cl. 418—6 **12 Claims**



1. An improved, scroll-type, positive fluid displacement apparatus, having means defining a circular and walled, fluid-working chamber, at least one fixed and one movable scroll-shaped, fluid-working element within said chamber, a first port opening into, and substantially centrally of, said chamber, a second port opening into said chamber radially outwardly-spaced from said first port, and means coupled to said one movable scroll-shaped, fluid-working element for moving the latter in an orbit relative to, and interfittingly with, said fixed element, to effect moving line contacts between said elements which define inter-element, walled, variable-volume pockets which, during orbit, close off, and move progressively and circularly, from one of said ports toward the second of said ports for opening of said pockets onto, and for communication thereof with, said second port, wherein the improvement comprises:

means, intermediate of, and spaced-apart from, both said first and second ports, for venting fluid from at least one of said pockets; and

means, intermediate of, and spaced-apart from, both said first and second ports, for introducing fluid into at least one other of said pockets prior to a communication of said other pocket with said second port; wherein

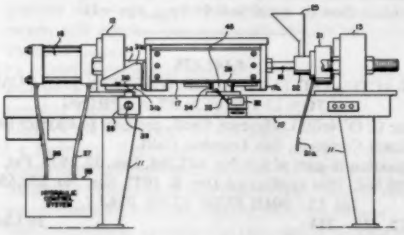
an end of said one movable element terminates in adjacency to at least one of said fluid-venting and fluid-introducing means, said end, during orbit thereof, moves along a circular path having a given diameter, and said end slidably and sealingly effects and maintains a line contact with a surface formed on said other fixed element, during a given portion of movement of said end about approximately 90° of said orbit, to cause given ones of said pockets, which are defined and sealingly closed off by said line contact between said surface of said fixed element and said end of said one movable element, to experience a closure thereof, to said one of said fluid-venting and fluid-introducing means, which is advanced a period of time which substantially corresponds with the time transpiring during said 90° of orbit.

4,141,678

EXTRUSION MACHINERY WITH SPEED CONTROL

Edward R. Jex, 475 Hickory Lance, Berwyn, Pa. 19312

Filed Jan. 6, 1976, Ser. No. 646,897
Int. Cl.[2] B29F *3/06, 3/08*
U.S. Cl. 425—145 **16 Claims**



1. In a machine for extruding material by means of a ram which propels the material through and out of the open end of a die, the machine having means for applying forces to the ram to move the ram alternately along a first path toward the die and a second path away from the die, the first path having an end portion and a portion ahead of the end portion,

the improvement comprising:

means operatively associated with said force applying means for controlling the force applying means to move the ram over the end portion of the first path at a substantially constant speed,

said control means having means for compensating for variations in back pressure from the material so as to maintain the ram speed substantially constant despite such variations, and

means operatively associated with said force applying means for controlling the force applying means to move the ram at a speed greater than the constant speed over the portion of the first path ahead of the end portion,

the last-named force control means being responsive to variations in back pressure from the material to permit

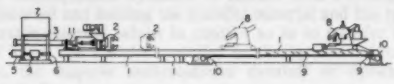
variations in the speed of the ram over the portion of the first path ahead of the end portion.

4,141,679

STRETCHING MACHINE

Toyohide Asano, and Masahiro Honda, both of Ube, Japan, assignors to UBE Industries, Ltd., Japan

Division of Ser. No. 740,089, Nov. 9, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,171
Claims priority, application Japan, Nov. 21, 1975, 50-139233
Int. Cl.[2] B29D *7/24*
U.S. Cl. 425—445 **3 Claims**



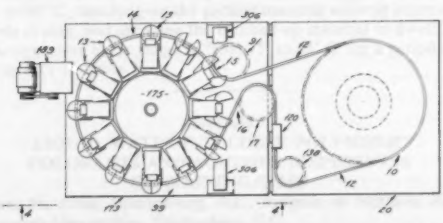
1. A stretching machine for plastically straightening an extruded product from an extruding press, comprising:
- a longitudinal machine frame fixed on a base arranged adjacent to the extruding press;
- a fixible tail stock arranged on the machine frame for gripping an end of said extruded product;
- a head stock slidable on the machine frame in one of the directions toward and away from said tail stock, said head stock gripping the other end of said extruded product;
- a cylinder having a movable piston rod associated with said head stock for actuating a sliding movement of said head stock;
- a hydraulic circuit including a variable displacement hydraulic pump for supplying said cylinder with a hydraulic fluid acting on the piston rod;
- means for variably adjusting the speed of the sliding movement of said head stock, and;
- means for automatically changing a sliding direction of said head stock,
- wherein said adjusting means of the sliding speed of said head stock comprises means for regulating the flow of the hydraulic fluid discharged from said variable displacement hydraulic pump toward said cylinder, said valve means being arranged in said hydraulic circuit.

4,141,680

ROTARY STRETCH BLOW MOLDING APPARATUS

Ivan L. Kauffman, Commerce Township, Oakland County, and Robert C. Kellogg, Hartland Township, Livingston County, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1973, Ser. No. 415,851
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—529 **34 Claims**



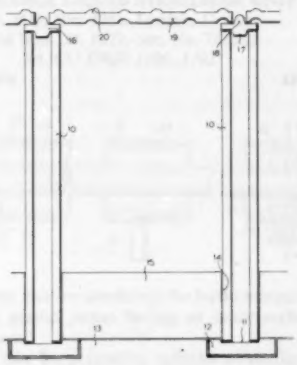
1. In a continuous motion stretch blow molding apparatus for blow molding hollow articles from preheated tubular parisons at orientation temperature having one open end and one closed end, the combination comprising:
- (a) a continuous motion parison transfer means;
- (b) a plurality of upwardly disposed stretch pin means carrying said open ends of said parisons in a fixed plan of travel and operatively carried on said transfer means;
- (c) a continuous motion rotary parison loading turret for receiving preheated parisons and for sequentially loading them onto said stretch pin means including:
  - (i) a parison loading station; and
  - (ii) a plurality of parison loading chutes operatively mounted on the rotary parison loading turret, each of said loading chutes arranged to be disposed over one of said stretch pin means and movable under said parison loading station for receiving a parison and loading the parison onto the stretch pin means disposed thereunder;
- (d) means synchronized with the movement of said chutes for sequentially dropping parisons into the chutes;
- (e) a continuous motion rotary molding turret having a plurality of molding stations; and
- (f) said transfer means being operative to locate each of said stretch pin means with a parison loaded thereon in an individual one of said molding stations for a stretching, blowing and cooling operation on each parison on each stretch pin means to form an article from each parison.

4,141,681

SUPPORT STRUCTURE FOR CERAMIC WARE

William J. Lovatt, Stoke on Trent, England, assignor to Acme Marls Limited, Stoke on Trent, England

Filed May 18, 1977, Ser. No. 798,148
Int. Cl.[2] F27D *5/00*
U.S. Cl. 432—258 **4 Claims**



1. A support structure for supporting ceramic ware during firing, the structure comprising, in combination, a rectangular base having at least three circular holes therein, each hole being positioned mid-way between a respective edge of the base and a center line thereof parallel to said respective edge; a plurality of lightweight cylindrical tubular props equal in number to said circular holes and firmly located upright in respective ones of said holes in use, the base being of a thickness comparable to the diameter of said props; and a plurality of caps equal in number to said circular holes, each of said caps comprising a downward projection which loosely locates the cap on top of a respective one of said tubular props, and a small upward projection.

4,141,682

TRANSFER DYEING WITH 1-HYDROXY-2-ALKYL-4-ANILINO ANTHRAQUINONE DYES

Colin W. Greenhalgh, and David F. Newton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

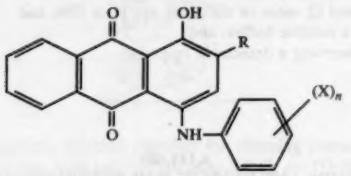
Filed Mar. 17, 1978, Ser. No. 887,853

Claims priority, application United Kingdom, Apr. 25, 1977, 17134/77

Int. Cl.[2] D06P *5/00*

U.S. Cl. 8—2.5 A 8 Claims

1. A process for the transfer color printing of synthetic textile materials which comprises placing a transfer material which carries a colored pattern, derived from one or more disperse anthraquinone dyestuffs, in contact with a synthetic textile material and heating the transfer material and the synthetic textile material whilst in contact so as to transfer the dyestuff from the transfer material to the synthetic textile material, the disperse anthraquinone dyestuff or dyestuffs being of the formula:



wherein R is an optionally substituted lower alkyl radical, X is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, nitrile or acyloxy, n is an integer from 1 to 3, and wherein when n is 2 to 3 the groups X may be the same or different.

4,141,683

PROCESS FOR THE DYEING OF WOOL

Hans-Peter Maier, Sulzbach am Taunus, and Harpal Singh, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,156

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2635990

Int. Cl.[2] D06P *3/82;* C09B *45/00*

U.S. Cl. 8—21 R 3 Claims

1. In a process for the dyeing of flat textile articles made of wool or mixtures thereof with synthetic fibres by means of 1:2 or 1:1 metal complex dyestuffs in the presence of a hydrotropic substance, and fixation of the dyestuffs by means of a dwelling operation, the improvement which comprises: padding a web of said textile material with an aqueous liquor containing a solution of at least one of said dyestuffs together with 80 to 120 g/l of dissolved urea at a temperature in the range of from 60° C. to 80° C.; batching-up the padded material without intermediate drying; and allowing the batched-up material to dwell at a temperature in the range of from 75° to 85° C. for a period of from 4 to 14 hours.

4,141,684

LIQUID, WATER-INSOLUBLE POLYMERIC COLORANTS AND AQUEOUS DISPERSIONS CONTAINING SAME

Hans H. Kuhn, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 728,522, Oct. 1, 1976, Pat. No. 4,091,034.

This application Dec. 22, 1977, Ser. No. 863,367

Int. Cl.[2] C09B *1/00, 7/00;* D06P *3/00*

U.S. Cl. 8—39 R 5 Claims

1. A liquid, water-insoluble colorant having the general formula R-(oleophilic polymeric constituent)$_n$ wherein R is an organic dyestuff radical selected from the group consisting of an azo dyestuff radical and an anthraquinone dyestuff radical, the oleophilic polymeric constituent is a polyalkylene oxide and co-polymers of polyalkylene oxides in which the alkylene moiety contains at least 3 carbon atoms, said polyalkylene oxide and co-polymers of polyalkylene oxides having a molecular weight of at least 500, and n is an integer of from 1 to 6.

4,141,685

METHOD OF BLEACHING TEXTILE FIBERS AND ACTIVATED BATH FOR THE COLD BLEACHING OF SUCH FIBERS

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex Societe Anonyme, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,677

Claims priority, application France, Jul. 26, 1976, 76 23289

Int. Cl.[2] D06L *3/00, 3/10*

U.S. Cl. 8—110 13 Claims

1. A composition for the activation of a sodium chlorite textile bleaching bath which consists of a bisulfitic derivative of an organic reducing compound and constituted of the reaction product of an alkali bisulfite selected from the group which consists of lithium bisulfite, sodium bisulfite and potassium bisulfite, with an aliphatic monoaldehyde having an alkyl or alkenyl group of 1 to 10 carbon atems, an aliphatic dialdehyde having an alkyl or alkenyl chain of 2 to 10 carbon atoms, an aliphatic monoketone having alkyl or alkenyl chains of 1 to 10 carbon atoms each connected to the ketocarbon, an aliphatic diketone having 1 to 10 carbon atoms in each alkyl or alkenyl group, or an aromatic aldehyde in which the aromatic group is phenyl.

4,141,686

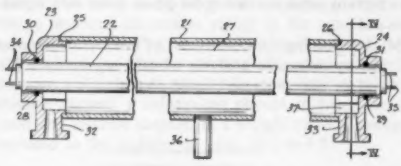
DISPOSABLE LIQUID STERILIZER UNIT

James H. Lewis, P.O. Box 2341, London, Canada

Filed Mar. 24, 1977, Ser. No. 781,021

Int. Cl.[2] C02B *1/00, 3/02*

U.S. Cl. 250—436 13 Claims



1. A disposable unit for sterilizing the liquid comprising:

an elongated plastic jacket having an inner surface and opposing ends,

an elongated tube for generating radiation to sterilize liquid in said jacket, said tube extending longitudinally along the interior of said jacket and having an outer surface, said inner and outer surface forming a flow chamber within said jacket around said tube, said tube being nonremovably received by said jacket,

said jacket being substantially opaque to said radiation,

means adjacent said opposing ends of said jacket for providing an inlet and an outlet for flow of liquid from said inlet into said chamber and into direct contact with said tube for sterilization by the radiation therefrom and finally out of said outlet,

said jacket ends including liquid tight seals engaging respective ends of said tube to prevent outflow of liquid from said flow chamber except via said outlet,

said tube ends each terminating in electrically conductive terminal means extending exteriorly of said jacket ends for applying electric power to the tube and for providing mechanical support to said unit.

4,141,687

AUTOMATIC APPARATUS AND METHOD FOR THE ASSAY OF FLUID SAMPLES

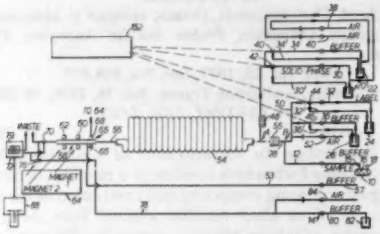
Gordon C. Forrest, Chelmsford; Ronald F. Jay, New Malden, and John A. Clements, Wallington, all of England, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,443

Claims priority, application United Kingdom, Mar. 12, 1976, 10089/76

Int. Cl.[2] **G01N** *33/16, 27/74*

U.S. Cl. 23—230 R **67 Claims**



23. A method of analyzing a plurality of fluid samples for particulate constituents of interest, which comprises the steps of:

(a) forming a reaction mixture of each of said fluid samples, each reaction mixture comprising a liquid phase and a solid phase, said solid phase comprising a first reagent bound to magnetically attractable particulate material and reactive with the particular constituent to be analyzed in each said fluid sample to form a reaction product, at least on said particulate material;

(b) flowing each said reaction mixture in turn and on a discrete basis along a conduit;

(c) magnetically trapping said particulate material in each said reaction mixture during flow along a first portion of said conduit, so as to hold said particulate material and thereby separate said solid phase from said liquid phase; and

(d) determining the constituent of interest in each said sample by selective analysis of said separated solid phase and/or said separated liquid phase.

4,141,688

COMPOSITION, DEVICE AND METHOD FOR DETERMINING REDUCING AGENTS

David A. N. Morris; Patricia A. Rupchock, and Mark T. Skarstedt, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 11, 1977, Ser. No. 823,618

Int. Cl.[2] **C07D** *279/34;* **G01N** *31/22;* **C07D** *265/38*

U.S. Cl. 23—230 B **59 Claims**

1. A composition for determining the presence of ascorbic acid in a test sample, said composition comprising

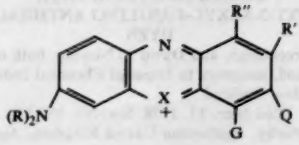
(a) an indicator compound comprising Lauth's Violet, azur A, methylene green, toluidine blue, gallocyanine, or prune pure, and

(b) a suitable buffer.

24. A method for determining the presence of ascorbic acid in a test sample comprising

(a) contacting the sample with a carrier matrix incorporated with:

(i) an indicator compound responsive to ascorbic acid, and having the structure



in which X is O or S, wherein when X is S

R, R′ and R″, same or different, are H or lower alkyl,

Q is NH_2 or N(lower alkyl)$_2$, and

G is H, NO_2 or OH;

with the proviso that when X is S, Q is not $N(CH_3)_2$, R is not methyl and G, R′ and R″ are not H, simultaneously; and when X is O;

R and R′, same or different, are H or lower alkyl,

R″ is H, COOH, COOR, $CONR_2$ or

R″ and R′ together form a hydrocarbon ring having 4 to 7 carbon atoms, and

G and Q, same or different, are H or OH; and

(ii) a suitable buffer; and

(b) observing a detectable response.

4,141,689

METHODS AND DEVICES FOR DETERMINING THE CONCENTRATION OF A COMPONENT OF A FLUID

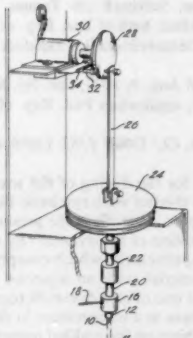
Imanuel Bergman, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed Jan. 19, 1977, Ser. No. 760,709

Claims priority, application United Kingdom, Jan. 21, 1976, 02338/76

Int. Cl.[2] **G01N** *31/00, 31/06, 31/08*

U.S. Cl. 23—232 R **14 Claims**



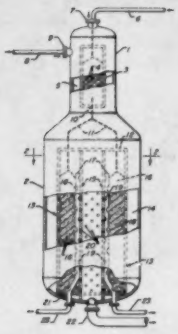
1. A method of testing a body of fluid for the presence of at least one component comprising exposing a measuring means successively to two masses of fluid derived from said body of fluid, one mass having been subjected to a modifying step whereby the two masses differ in respect of the concentration of an active component by an amount which is dependent upon its concentration in said body of fluid of the at least one component to be detected, the measuring means being responsive to the concentration of said active component in the fluid to which the measuring means is exposed, the measuring means being exposed to at least one of the two masses of fluid for a time sufficient for the measuring means to reach a known proportion less than one hundred percent of its equilibrium state with any active component in the fluid to which the measuring means is exposed.

4,141,690

CATALYTIC REACTION CHAMBER FOR GRAVITY-FLOWING CATALYST PARTICLES

Paul J. Persico, Hinsdale; Robert F. Millar, Mc Cook, and Robert H. Jensen, Clarendon Hills, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 5, 1977, Ser. No. 822,164
Int. Cl.[2] B01J 8/12; C10G 35/12
U.S. Cl. 422—216 10 Claims



1. A catalytic reaction chamber for effecting contact of a reactant stream with catalyst particles which are (1) disposed therein as an annular-form bed and, (2) downwardly movable therethrough via gravity-flow, said reaction chamber comprising, in cooperative relationship:

(a) an outer, perforated catalyst-retaining screen (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said chamber to provide a reactant stream manifold space therebetween;

(b) an inner, perforated centerpipe (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said catalyst-retaining screen to provide said annular-form catalyst bed therebetween;

(c) a plurality of catalyst inlet conduits connected to the upper portion of said chamber and communicating with said annular-form catalyst bed; and,

(d) a plurality of vertically-positioned catalyst-transfer conduits (i) circumferentially-disposed substantially adjacent the outer surface of said perforated centerpipe, (ii) extending substantially the entire length of said annular-form catalyst bed and, (iii) containing a first plurality of apertures facing into said catalyst bed and sized to permit catalyst particles to flow therethrough, and a second plurality of apertures facing said perforated centerpipe and sized to inhibit the flow of catalyst particles therethrough.

4,141,691

USE OF WATER SOLUBLE POLYMERS IN COAL FLOTATION CIRCUITS

Joseph M. Antonetti, Burgettstown, Pa., and Glen F. Snow, Birmingham, Ala., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1977, Ser. No. 860,010
Int. Cl.[2] C10L 9/10; B01D 11/00
U.S. Cl. 44—1 R 3 Claims

1. A process for improving the recovery of clean coal from flotation circuits which comprises adding an effective amount of a water soluble cationic polymer to the coal being processed to decrease the amount of clay in the aqueous coal suspension being treated.

3. A process as in claim 1 wherein the polymer is poly(dimethyl diallyl ammonium chloride).

4,141,692

TAGGED FUEL COMPOSITIONS

James L. Keller, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 19, 1977, Ser. No. 760,623
Int. Cl.[2] C10L 1/20
U.S. Cl. 44—59 14 Claims

1. A liquid hydrocarbon fuel composition containing dissolved therein at least about 0.01 but no more than about 10 mg/l of a chlorinated hydrocarbon component consisting essentially of at least one chlorohydrocarbon or chlorocarbon containing at least 3 chlorine atoms and at least 2 carbon atoms per molecule, and having a Cl/C atomic ratio of at least ½, said chlorinated hydrocarbon component being further selected to give an electron capture detector gas chromatogram peak distinguishable from the chromatogram peaks produced by all other components of said fuel, thereby forming a readily detectable tracer for said fuel.

8. A liquid hydrocarbon fuel composition containing dissolved therein at least about 0.01 but no more than about 10 mg/l of a chlorinated hydrocarbon component consisting essentially of at least one chlorohydrocarbon or chlorocarbon having from 3 to about 8 chlorine atoms and 2–10 carbon atoms per molecule, and having a Cl/C atomic ratio between 0.5 and 3, at least 2 of said chlorine atoms per molecule being bonded to the same or adjacent carbon atoms, said chlorinated hydrocarbon component being further selected to give an electron capture detector gas chromatogram peak distinguishable from the chromatogram peaks produced by all other components of said fuel, thereby forming a readily detectable tracer for said fuel.

4,141,693

MANGANESE CONTAINING FUELS

Daniel W. Feldman, Beachwood; James W. Sprague, Bedford, and Franklin Veatch, Cleveland, all of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio

Filed Dec. 18, 1974, Ser. No. 530,575
Int. Cl.[2] C01L 1/22
U.S. Cl. 44—68 10 Claims

1. Gasoline containing an added gasoline soluble manganese compound to improve the octane rating of the gasoline and including an additive having less than 20 carbon atoms and being selected from the group consisting of a monocarboxylic acid or its ester, a dicarboxylic acid or its monoester or diester, an alkylamine, phenol, a substituted phenol of less than 10 carbon atoms or mixture thereof, in a weight ratio of manganese compound to the additive of from 50:1 to 1:5.

4,141,694

APPARATUS FOR THE GASIFICATION OF CARBONACEOUS MATTER BY PLASMA ARC PYROLYSIS

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corporation, Raleigh, N.C.

Division of Ser. No. 827,867, Aug. 26, 1977, which is a continuation-in-part of Ser. No. 645,413, Dec. 30, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,671
Int. Cl.[2] C10J 3/20
U.S. Cl. 48—61 5 Claims

1. An apparatus for producing fuel gases from particulate carbonaceous matter, said apparatus comprising:

(a) a refractory-lined horizontal turbular furnace having a wall enclosed hearth member extending lengthwise of said furnace and an unobstructed chamber positioned above said hearth member and contiguous therewith;

(b) a supply of an electrically conductive meltable material positioned in said hearth member, said meltable material being electrically conductive in both the solid and molten states and having a density greater than the char produced by devolatilization of said carbonaceous matter, said meltable material being further characterized by a chemical

4,141,687

AUTOMATIC APPARATUS AND METHOD FOR THE ASSAY OF FLUID SAMPLES

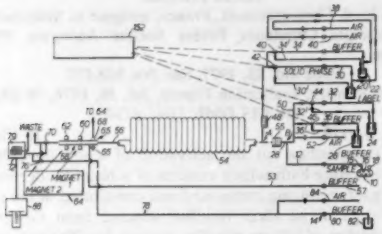
Gordon C. Forrest, Chelmsford; Ronald F. Jay, New Malden, and John A. Clements, Wallington, all of England, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,443

Claims priority, application United Kingdom, Mar. 12, 1976, 10089/76

Int. Cl.[2] **G01N** *33/16, 27/74*

U.S. Cl. 23—230 R **67 Claims**



23. A method of analyzing a plurality of fluid samples for particulate constituents of interest, which comprises the steps of:

(a) forming a reaction mixture of each of said fluid samples, each reaction mixture comprising a liquid phase and a solid phase, said solid phase comprising a first reagent bound to magnetically attractable particulate material and reactive with the particular constituent to be analyzed in each said fluid sample to form a reaction product, at least on said particulate material;

(b) flowing each said reaction mixture in turn and on a discrete basis along a conduit;

(c) magnetically trapping said particulate material in each said reaction mixture during flow along a first portion of said conduit, so as to hold said particulate material and thereby separate said solid phase from said liquid phase; and

(d) determining the constituent of interest in each said sample by selective analysis of said separated solid phase and/or said separated liquid phase.

4,141,688

COMPOSITION, DEVICE AND METHOD FOR DETERMINING REDUCING AGENTS

David A. N. Morris; Patricia A. Rupchock, and Mark T. Skarstedt, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 11, 1977, Ser. No. 823,618

Int. Cl.[2] **C07D** *279/34;* **G01N** *31/22;* **C07D** *265/38*

U.S. Cl. 23—230 B **59 Claims**

1. A composition for determining the presence of ascorbic acid in a test sample, said composition comprising

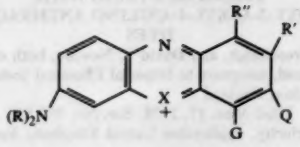
(a) an indicator compound comprising Lauth's Violet, azur A, methylene green, toluidine blue, gallocyanine, or prune pure, and

(b) a suitable buffer.

24. A method for determining the presence of ascorbic acid in a test sample comprising

(a) contacting the sample with a carrier matrix incorporated with:

(i) an indicator compound responsive to ascorbic acid, and having the structure



in which X is O or S, wherein when X is S

R, R′ and R″, same or different, are H or lower alkyl,

Q is NH_2 or N(lower alkyl)$_2$, and

G is H, NO_2 or OH;

with the proviso that when X is S, Q is not $N(CH_3)_2$, R is not methyl and G, R′ and R″ are not H, simultaneously; and when X is O;

R and R′, same or different, are H or lower alkyl,

R″ is H, COOH, COOR, $CONR_2$ or

R″ and R′ together form a hydrocarbon ring having 4 to 7 carbon atoms, and

G and Q, same or different, are H or OH; and

(ii) a suitable buffer; and

(b) observing a detectable response.

4,141,689

METHODS AND DEVICES FOR DETERMINING THE CONCENTRATION OF A COMPONENT OF A FLUID

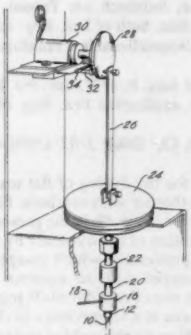
Imanuel Bergman, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed Jan. 19, 1977, Ser. No. 760,709

Claims priority, application United Kingdom, Jan. 21, 1976, 02338/76

Int. Cl.[2] **G01N** *31/00, 31/06, 31/08*

U.S. Cl. 23—232 R **14 Claims**



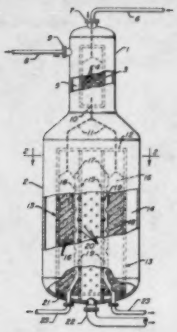
1. A method of testing a body of fluid for the presence of at least one component comprising exposing a measuring means successively to two masses of fluid derived from said body of fluid, one mass having been subjected to a modifying step whereby the two masses differ in respect of the concentration of an active component by an amount which is dependent upon its concentration in said body of fluid of the at least one component to be detected, the measuring means being responsive to the concentration of said active component in the fluid to which the measuring means is exposed, the measuring means being exposed to at least one of the two masses of fluid for a time sufficient for the measuring means to reach a known proportion less than one hundred percent of its equilibrium state with any active component in the fluid to which the measuring means is exposed.

4,141,690

CATALYTIC REACTION CHAMBER FOR GRAVITY-FLOWING CATALYST PARTICLES

Paul J. Persico, Hinsdale; Robert F. Millar, Mc Cook, and Robert H. Jensen, Clarendon Hills, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 5, 1977, Ser. No. 822,164
Int. Cl.[2] B01J 8/12; C10G 35/12
U.S. Cl. 422—216 10 Claims



1. A catalytic reaction chamber for effecting contact of a reactant stream with catalyst particles which are (1) disposed therein as an annular-form bed and, (2) downwardly movable therethrough via gravity-flow, said reaction chamber comprising, in cooperative relationship:

(a) an outer, perforated catalyst-retaining screen (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said chamber to provide a reactant stream manifold space therebetween;

(b) an inner, perforated centerpipe (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said catalyst-retaining screen to provide said annular-form catalyst bed therebetween;

(c) a plurality of catalyst inlet conduits connected to the upper portion of said chamber and communicating with said annular-form catalyst bed; and,

(d) a plurality of vertically-positioned catalyst-transfer conduits (i) circumferentially-disposed substantially adjacent the outer surface of said perforated centerpipe, (ii) extending substantially the entire length of said annular-form catalyst bed and, (iii) containing a first plurality of apertures facing into said catalyst bed and sized to permit catalyst particles to flow therethrough, and a second plurality of apertures facing said perforated centerpipe and sized to inhibit the flow of catalyst particles therethrough.

4,141,691

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Filed Dec. 12, 1977, Ser. No. 860,010
Int. Cl.[2] C10L 9/10; B01D 11/00
U.S. Cl. 44—1 R 3 Claims

1. A process for improving the recovery of clean coal from flotation circuits which comprises adding an effective amount of a water soluble cationic polymer to the coal being processed to decrease the amount of clay in the aqueous coal suspension being treated.

3. A process as in claim 1 wherein the polymer is poly(-dimethyl diallyl ammonium chloride).

4,141,692

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Filed Jan. 19, 1977, Ser. No. 760,623
Int. Cl.[2] C10L 1/20
U.S. Cl. 44—59 14 Claims

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4,141,693

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Filed Dec. 18, 1974, Ser. No. 530,575
Int. Cl.[2] C01L 1/22
U.S. Cl. 44—68 10 Claims

1. Gasoline containing an added gasoline soluble manganese compound to improve the octane rating of the gasoline and including an additive having less than 20 carbon atoms and being selected from the group consisting of a monocarboxylic acid or its ester, a dicarboxylic acid or its monoester or diester, an alkylamine, phenol, a substituted phenol of less than 10 carbon atoms or mixture thereof, in a weight ratio of manganese compound to the additive of from 50:1 to 1:5.

4,141,694

APPARATUS FOR THE GASIFICATION OF CARBONACEOUS MATTER BY PLASMA ARC PYROLYSIS

Salvador L. Camacho, Raleigh, N.C., assignor to Technology Application Services Corporation, Raleigh, N.C.

Division of Ser. No. 827,867, Aug. 26, 1977, which is a continuation-in-part of Ser. No. 645,413, Dec. 30, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,671
Int. Cl.[2] C10J 3/20
U.S. Cl. 48—61 5 Claims

1. An apparatus for producing fuel gases from particulate carbonaceous matter, said apparatus comprising:

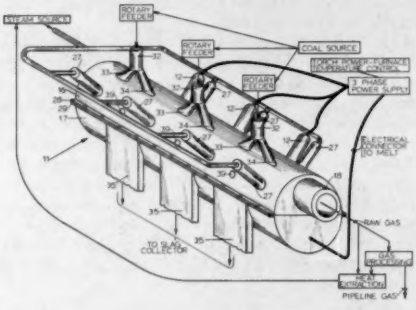
(a) a refractory-lined horizontal turbular furnace having a wall enclosed hearth member extending lengthwise of said furnace and an unobstructed chamber positioned above said hearth member and contiguous therewith;

(b) a supply of an electrically conductive meltable material positioned in said hearth member, said meltable material being electrically conductive in both the solid and molten states and having a density greater than the char produced by devolatilization of said carbonaceous matter, said meltable material being further characterized by a chemical

inertness with respect to the fuel gases produced from said particulate carbonaceous matter;

(c) one or more long plasma arc torches mounted in a wall portion of said furnace above said hearth with the respective arc sustaining ends of each of said torches being directed towards said hearth member, wherein said plasma arc torches are adapted and oriented to initiate and sustain a plasma arc column in electrical circuit with said electrically conductive meltable material to effect the melting thereof and to provide a heat mass for heating said furnace chamber to a predetermined operating temperature;

(d) substantially air-tight means for continuously supplying said particulate carbonaceous matter in separate plural streams into said heated furnace from an elevated position



above said unobstructed chamber so as to enable the incoming carbonaceous matter to have an unobstructed fall for a predetermined distance and time through a substantially constant temperature zone within said chamber to effect devolatilization thereof prior to deposition on the surface of said molten material contained in said hearth member where upon deposition said devolatilized carbonaceous matter forms char-mounds on said meltable material and is gasified;

(e) reactant supply means connected to said furnace to introduce a continuous supply of a carbon-combining reactant into said furnace adjacent each of said plasma arc columns, said columns being directed toward said char mounds to effect swirling thereof; and

(f) means for removing product gases and separate means for removing ash residue from said furnace.

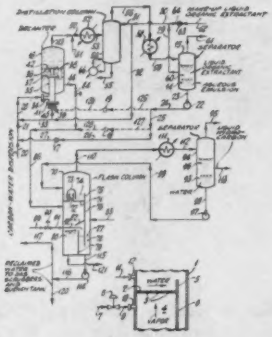
4,141,695

PROCESS FOR GAS CLEANING WITH RECLAIMED WATER

Charles P. Marion, Mamaroneck, N.Y.; Lawrence E. Estabrook, Long Beach, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,952
Int. Cl.[2] C10J *3/00*; C10B *2/14*
U.S. Cl. 48—197 R **31 Claims**

1. In a partial oxidation process for producing gaseous mixtures comprising H_2, CO, H_2O, entrained particulate carbon and at least one material from the group CO_2, H_2S, COS, CH_4, N_2, A_r, and ash by the partial oxidation of a hydrocarbonaceous feed with a free-oxygen containing gas, optionally with a temperature moderator, in a freeflow noncatalytic gas generator at a temperature in the range of about 1300° to 3000° F. and a pressure in the range of about 1 to 250 atm., cooling the effluent gas stream from said reaction zone and contacting said gas stream with water in gas quenching or cleaning operations, or both thereby removing said entrained particulate carbon and any ash and producing a clean gas stream and a carbon-water dispersion containing any ash, the improvement comprising: (1) mixing a liquid organic extractant and a liquid aqueous emulsion from (5) with said carbon-water dispersion, and breaking-up said emulsion; separating in a decanting operation a liquid dispersion comprising extractant-particulate carbon-water containing at least one gaseous impurity from the group H_2S, NH_3, and CO_2, from a bottoms water layer containing entrained particulate carbon and any ash and at least one gaseous impurity from the group H_2S, NH_3, and CO_2; (2) mixing the extractant-carbon-water dispersion from (1) with a heavy liquid hydrocarbon; (3) heating the mixture from (2) above the vaporization temperature of water and said liquid extractant but below the boiling point of said heavy liquid



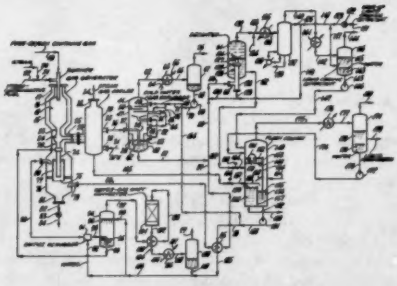
hydrocarbon in a distillation zone, cooling the overhead vapor from said distillation zone to condense out and to separate in a first separation zone an upper layer of liquid organic extractant and a lower liquid layer of aqueous emulsion from an overhead stream of uncondensed gaseous impurities; (4) removing a dispersion of heavy liquid hydrocarbon and particulate carbon from the bottom of said distillation zone and introducing same into said gas generator as a portion of the feed; and (5) removing said liquid organic extractant and said aqueous emulsion from said first separation zone and recycling same to said decanting operation in (1).

4,141,696

PROCESS FOR GAS CLEANING WITH RECLAIMED WATER AND APPARATUS FOR WATER RECLAMATION

Charles P. Marion, Mamaroneck, N.Y.; Lawrence E. Estabrook, Long Beach, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,951
Int. Cl.[2] C10J *3/00*; C01B *2/14*
U.S. Cl. 48—197 R **22 Claims**



1. In a partial oxidation process for producing gaseous mixtures comprising H_2, CO, H_2O entrained particulate carbon and at least one material from the group CO_2, H_2S, COS, CH_4, N_2, Ar, and ash by the partial oxidation of a hydrocarbona-

ceous fuel with a free-oxygen containing gas optionally with a temperature moderator in a free-flow, non-catalytic gas generator at a temperature in the range of about 1300° to 3000° F. and a pressure in the range of about 1 to 250 atm., cooling the effluent gas stream from said reaction zone and contacting said gas stream with water in a gas quenching or cleaning zone, or both thereby removing said entrained particulate carbon and any ash and producing a clean gas stream and a carbon-water dispersion containing any ash, the improvement comprising: (1) mixing a liquid organic extractant with said carbon-water dispersion, and separating by gravity in a first separation zone a liquid extractant-particulate carbon dispersion containing at least one gaseous impurity selected from the group H_2S, NH_3, and CO_2, and a dilute water stream containing carbon and ash and at least one gaseous impurity selected from the group H_2S, NH_3, and CO_2; (2) mixing the extractant-carbon dispersion from (1) with a heavy liquid hydrocarbon; (3) separating the mixture from (2) in a distillation zone into (a) a dispersion of heavy liquid hydrocarbon and particulate carbon, (b) an overhead gaseous stream comprising H_2O, organic extractant, and at least one gaseous impurity from the group H_2S, NH_3, and CO_2; (4) removing the dispersion of heavy liquid hydrocarbon and particulate carbon from (3*a*) and introducing same into said gas generator as a portion of the feed; (5) cooling and condensing the overhead gaseous stream from said distillation zone and introducing the cooled stream into a second separation zone; (6) separating said cooled stream in said second separation zone into an upper layer of liquid organic extractant which floats on a lower layer of water containing at least one of said gaseous impurities, and an overhead stream of uncondensed gaseous impurities; (7) separating said liquid organic extractant and recycling same to said first separation zone in (1) as at least a portion of said extractant; introducing the water separated in said second separation zone in (6) on to a horizontal stripping plate spaced within a vertical flash column containing first and second bottom chambers separated by a weir; and wherein said stripping plate contains dispersive means for dispersing steam produced below said stripping plate through the water on said stripping plate, and overflow and downflow means for discharging stripped water from said stripping plate into said second bottom chamber; (8) introducing at reduced pressure the water stream containing entrained solids from the first separation zone in (1) into said flash column below said stripping plate and in the space above said first bottom chamber, thereby vaporizing a portion of said water stream and passing the vapors up through said dispersive means in said stripping plate and through the water contained on said plate thereby stripping gases from said water, and introducing the unvaporized portion of said water stream into said first bottoms chamber; (9) removing from said flash column a stream of vapors comprising H_2O, hydrocarbons and at least one member of the group H_2S, NH_3, and CO_2; cooling said vapor stream and condensing and separating in a third separation zone liquid water and liquid hydrocarbon from the uncondensed gases; and recycling said water on to the stripping plate of said flash column; (10) removing waste water containing solids from said first bottoms chamber and discharging same from the system; and (11) removing reclaimed water from said second bottoms chamber and recycling same to said gas cleaning zone.

4,141,697

ALKALINE TREATED MOLECULAR SIEVES TO INCREASE COLLECTION EFFICIENCY OF ELECTROSTATIC PRECIPITATOR

Vincent M. Albanese, Lockport, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 9, 1978, Ser. No. 868,007
Int. Cl.[2] B03C *1/00*
U.S. Cl. 55—5 **2 Claims**

1. A method of improving the conductivity of particles entrained in a stream of particle-laden gas formed by the burning of coal, which particles are collected by an electrostatic precipitator which comprises treating said gas containing the particles prior to contact with the electrostatic precipitator at a temperature not greater than about 1800° F. with a amount of a molecular sieve sufficient to decrease resistivity to 10^{+8}–10^{+10} ohm-cm. having the formula:

$$M_{2/w}O:Al_2O_3:wSiO_2:YH_2O$$

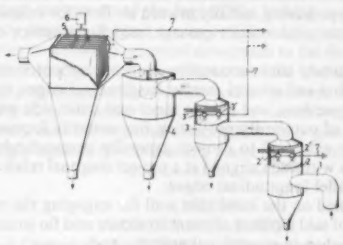
wherein M represents at least one cation which balances the electrovalence of the tetrahedra, n represents the valence of the cation, w the moles of SiO_2 and Y the moles of H_2O and then passing the gas to the electrostatic precipitator.

4,141,698

METHOD OF CLEANING PARTICLE BEARING GAS

Per G. Kihlstedt, Bromma, and Hedvig E. B. Hassler, Enskede, both of Sweden, assignors to Advanced Mineral Research AB, Stockholm, Sweden

Filed May 25, 1977, Ser. No. 800,433
Claims priority, application Sweden, Jun. 1, 1976, 7606162
Int. Cl.[2] B03C *3/16*
U.S. Cl. 55—6 **12 Claims**



1. A process for cleaning particle bearing gas by combining said gas together with friction-electrically charged water droplets, wherein water in liquid state and having a conductivity of at most about 1×10^{-5} ohm^{-1}cm^{-1} is charged electrically by friction and is converted to mist form by means of an electrically conducting liquid mist generating nozzle from which charge of a polarity opposite to that of the mist is continuously conducted away, whereupon the mist is combined with the gas to separate the dust.

4,141,699

PROCESS FOR SEPARATING GAS MIXTURES, ESPECIALLY ISOTOPES

James B. Anderson, 743 Glenn Rd., State College, Pa. 16801

Filed Apr. 2, 1974, Ser. No. 457,370
Int. Cl.[2] B01D *57/00*
U.S. Cl. 55—17 **6 Claims**

1. A process for the separation of the components of a gaseous mixture which comprises:

(a) passing said mixture from high pressure regions through two separate nozzles into a lower pressure region,

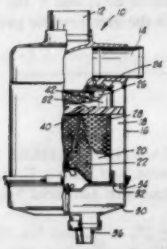
(b) placing the nozzles in opposition to each other, with an angle of 160 degrees to 200 degrees between their flow directions, such that the nozzles flows impinge on one another, and

(c) withdrawing the components of said mixture as two or more streams from the region of the interaction of the two supersonic flows, each stream enriched in one or more of the components of the original mixture with respect to the other components.

4,141,700
FIN STRUCTURE FOR AIR PRE-CLEANER

Wilson L. Norton, Jr., and Willis H. Risse, both of Oklahoma City, Okla., assignors to Air Refiner, Inc., Oklahoma City, Okla.

Filed Sep. 27, 1976, Ser. No. 727,137
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—337 **21 Claims**



1. A fin structure for installation about the cylindrical outer surface of a conventional air filter element of the centrifugal pre-cleaner type having radially inward air flow for exhaust of clean air via an axial interior passage, said fin structure comprising:

a flat, relatively thin rectangular strip of resilient material having first and second parallel longitudinal edges, opposite end portions, and having inner and outer side walls;

a plurality of outwardly projecting fins unitarily formed on the outer side wall to project generally perpendicular to said strip with each aligned at a pre-set diagonal relative to said parallel longitudinal edges;

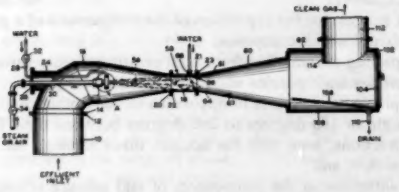
means formed on the inner side wall for engaging the outer surface of said air filter element to secure said fin structure thereto when in operational attitude; and

first and second coupling means formed respectively on the opposite end portions of said strip for mutually engaging the opposite end portions to secure said strip in cylindrical operational attitude about the outer surface of said filter element with said fins extending radially outwardly therefrom.

4,141,701
APPARATUS AND PROCESS FOR THE REMOVAL OF POLLUTANT MATERIAL FROM GAS STREAMS

Thomas K. Ewan, Daingerfield; Malley R. Bass, Longview; Jennings D. Means, Gilmer; James L. Frier, Longview, and Orvis L. Holland, Linden, all of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Continuation-in-part of Ser. No. 636,318, Nov. 28, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,724
Int. Cl.[2] B01D *45/00, 47/10*
U.S. Cl. 55—90 **24 Claims**

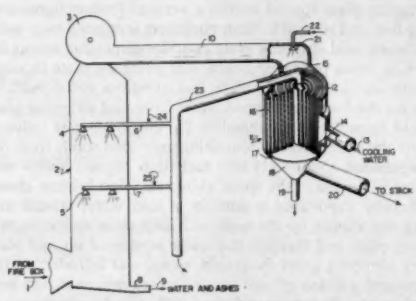


20. In a process for the removal of pollutant material comprising particulates from a polluted gas which includes driving a stream of said polluted gas through a mixing tube by forming and discharging from a nozzle means a jet of pressurized compressible fluid such as steam or air or the whole or a part of the polluted gas itself directed into the mixing tube, forming a series of jet sprays of liquid in a first atomized condition disposed circumferentially about said jet of compressible fluid, further atomizing said liquid by directing said jet sprays into the outer region of said jet of compressible fluid as it emerges from said nozzle means for forming a mixture comprising said polluted gas and said liquid in the form of further atomized droplets flowing through said mixing tube, said mixture as it approaches the exit end of said mixing tube comprising the liquid droplets encapsulating substantially all of the particulates initially contained in said stream of polluted gas; the improvement which comprises directing said mixture containing said droplets from said mixing tube into a diffuser having gradually increasing cross-sectional area defined by an inner surface comprising opposed diverging surface portions, deflecting the flow of said mixture as it enters said diffuser away from one of said opposed diverging surface portions of said diffuser and toward the other of said opposed diverging surface portions to cause deentrainment of said droplets from said mixture.

4,141,702
CONDENSATION CLEANING OF EXHAUST GASES

Egbert deVries, Kettering, Ohio, assignor to QUAD Corporation, Highland Park, Ill.

Filed Jul. 11, 1977, Ser. No. 814,420
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—94 **9 Claims**



1. A process for the removal of solid and gaseous contaminants from a hot particulate-laden exhaust gas stream which comprises:

passing the gas stream upwardly through an open scrubbing tower;

subjecting the upwardly flowing gas stream to a downwardly directed water spray only of sufficient duration and amount to saturate the gas stream and to cool it to a temperature below the boiling point of water;

passing the saturated and cooled gas stream, now carrying entrained water droplets and fine particulate matter, directly to and downwardly through a spiral flow-cross flow heat exchanger having a heat exchange element oriented with its axis in a vertical direction, said heat exchange element defining a single closed, spiral liquid passage and an open, annular gas passage, said liquid and gas passages having vertically oriented and parallel boundaries;

maintaining said heat exchange element at a temperature substantially below the temperature of the incoming gas stream by passing a cooling liquid therethrough;

condensing water vapor contained in said gas stream on the heat exchange element surfaces, said condensation trap-

ping and removing particulate matter and soluble and condensible gases contained in said gas stream;

removing a condensate stream carrying contaminants from the heat exchanger, and

removing a cleaned gas stream from the heat exchanger at a point below the heat exchange element.

4,141,703

AIR-POLLUTION FILTER AND FACE MASK

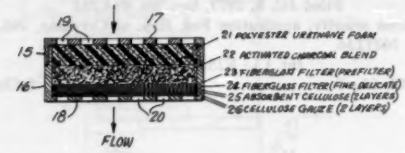
Charles L. Mulchi, New Carrolton, Md., assignor to Stanley I. Wolf, Silver Spring, Md., a part interest

Continuation-in-part of Ser. No. 653,717, Jan. 30, 1976, Pat. No. 4,064,876. This application Mar. 4, 1977, Ser. No. 774,647

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.² B01D *50/00*

U.S. Cl. 55—316 **12 Claims**



1. A filter which has a plurality of component elements which, in combination, provide means capable of passing a gas stream therethrough at a flow rate which, per circular section of about 5 centimeters in diameter, is in the range of from 50 ± 20 liters per minute at a pressure drop of at most about 4.0 centimeters of water, the elements comprising, in sequence:

i. porous compressible means to filter contaminated gas and particulate activated charcoal means;

ii. low-resistant prefilter means to retain particles and to protect subsequent elements;

iii. low-resistant filter means for filtering particulate matter as small as 0.3 micron in diameter and moisture-trapping absorbent means; and

iv. means to protect preceding elements;

the particulate activated charcoal means being no further upstream than the porous compressible means; the moisture-trapping absorbent means being no further upstream than the low-resistant filter means; the porous compressible means providing means for removal of large dust particles, pollen grains, other particulate matter and aerosol droplets from the gas stream; the particulate activated carbon means providing means for removal of irritating gases from the gas stream; each element being immediately juxtaposed to adjacent elements; and the porous compressible means exerting sufficient positive pressure to maintain the particulate activated charcoal means in position.

4,141,704

DEVICE FOR CLAMPING A CASSETTE FILTER IN A FILTER HOUSING

Svante O. Berglund, Hovmantorp, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

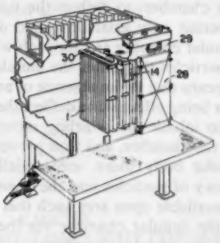
Filed Jan. 5, 1978, Ser. No. 866,994

Claims priority, application Sweden, Jan. 5, 1977, 7700091

Int. Cl.² B01D *46/02*

U.S. Cl. 55—379 **2 Claims**

1. A device for clamping a cassette filter in a filter housing, cassette filter comprising a cassette frame having a clean-gas opening with associated filter cells, and said filter housing is provided with a connecting frame and clamping members to clamp the clean-gas opening of the cassette filter sealingly against the connecting frame, the clamping members comprising a U-shaped locking rod with two legs having their ends pivotally supported in the filter housing and pins arranged eccentrically in relation to the pivotal axis and projecting toward each other, a flat-section rod disposed along each side of the filter housing and provided on its lower surface with at least two V-shaped recesses and at its forward end a vertical groove receiving one of said pins, support members attached to the filter housing for supporting said rod, a bar fixed in the horizontal direction and movable in the vertical direction on the flat-section rod to support one side of the cassette filter, the flat-section rod in the unclamped position of the cassette filter resting with the support members in the V-shaped recess and at the same time disposing the legs of the locking rod substantially upward, and upon clamping the cassette filter in the filter housing, movement of the legs of the locking rod in a downwardly directed pivoted movement about its pivotal axis cause the pins to transfer horizontal movement to the flat-section rod so that the support members slide out of the V-shaped recesses, thereby causing the flat-section rod to perform a vertical upwardly directed movement, which is transferred to the bar, whereby said bar lifts the cassette filter and presses the same sealingly against the connecting frame of the filter housing.



4,141,705

VORTEX SEPARATOR

Joseph Campolong, St. Petersburg, Fla., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 360,516, May 15, 1973, Pat. No. 3,895,930, which is a continuation-in-part of Ser. No. 306,119, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 31,471, Apr. 24, 1970, abandoned. This application Jan. 23, 1975, Ser. No. 543,699

The portion of the term of this patent subsequent to Jul. 22, 1992, has been disclaimed.

Int. Cl.² B01D *45/12*

U.S. Cl. 55—394 **3 Claims**

1. A vortex particle separator with provision to prevent abrasion by separated particles retained therein, comprising a tubular body having an inlet at one end, an outlet at the opposite end and a central passage therebetween; a deflector coaxially mounted in the passage adjacent the inlet, having a plurality of helical vanes abutting the wall of the passage, and positioned at an angle to the line of flow from the inlet to the outlet so as to create a vortex stream in the influent air, which concentrates the contaminant particles in the whirling air stream at the periphery of the passage, thereby leaving the air at the center of the passage relatively clean; a generally tubular outlet member disposed within the central passage at the outlet end of

the tubular body, for delivery of clean air from the central passage of the tubular body; said tubular outlet member defining an annular contaminant chamber between the exterior of the outlet member and the interior wall of the central passage of the tubular body receiving and storing separated contaminant particles; a wall extending between the tubular outlet member and the tubular body at the outlet end of the annular chamber at the outlet end of the tubular body, closing off the annular chamber at that end; and baffle means comprising a plurality of radical fins which extend at least partially across the annular chamber, to deflect the whirling air and particle flow and permit only axial flow, and define an inlet opening into the annular chamber and through which all flow of air and separated particles that enter the annular chamber must pass, the baffle means due to the absence of an outlet from the annular chamber being effective to deflect the whirling air stream in a manner to inhibit the whirling movement of the particles retained in the chamber, and thus prevent abrasion of the wall of the tubular body there, substantially without interfering with the entry of particles into the chamber, the inlet opening having an available open area such that at least some particles that enter the annular chamber via the inlet opening cannot escape from the annular chamber.

4,141,706

DROPLET SEPARATOR

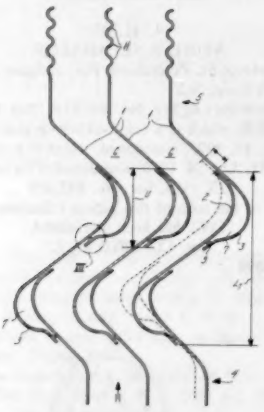
Ulrich Regehr, Susterfeldstr. 65, Aachen, Fed. Rep. of Germany (5100)

Filed May 2, 1977, Ser. No. 792,998

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619688

Int. Cl.² B01D *45/16*

U.S. Cl. 55—437 **5 Claims**



1. In a droplet separator for removing all liquid droplets of a size above a minimum limiting droplet diameter d from a gas stream entraining said droplets with a defined droplet-size spectrum at an inlet velocity v and comprising a stack of vertically extending corrugated separator plates having an interplate spacing T, a crest-to-crest spacing λ on each plate and collecting pockets at each crest having inlet slots opening into the gas stream traversing respective flow passages between said plates between an inlet side of said stack and an outlet side thereof, said passages having a length L_K measured in a straight-line dimension between said inlet and outlet sides, the improvement which comprises, in combination with means for supplying the gas stream to said inlet side of said stack at said velocity v:

(a) each of said plates is formed by a plurality of plate members of length L_T measured in a straight-line dimension between the inlet and outlet sides of the stack, the successive plate members of each plate overlapping over a distance U measured in a straight-line dimension between the inlet and outlet sides of the stack at a respective pocket;

(b) the length L_T being greater by the distance U than $n\lambda/2$ where n is the number selected from one half and one;

(c) said passage length L_K is substantially equal to $m\ \lambda/2$ where m is an integer; and

(d) the product of the inlet velocity v and λ corresponds to the product of the passage length L_K and a characteristic velocity v_c constituting the allowable inlet velocity of the separator at which the spacing T defines the limiting droplet diameter d, λ being between 2 and 7 times T.

4,141,707

CRYOGENIC LIQUEFACTION

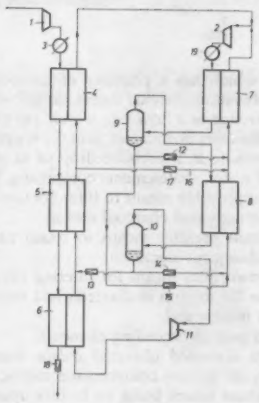
Helmut Springmann, Brucknerweg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,242

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631134

Int. Cl.² F25J *1/02, 3/04*

U.S. Cl. 62—9 **8 Claims**



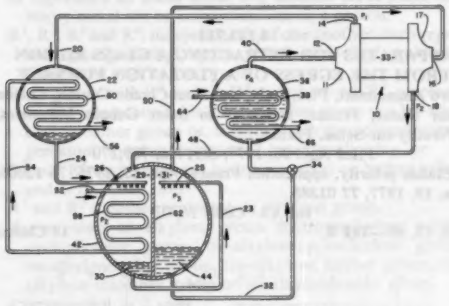
1. In a process for the liquefaction of air or of primary components thereof comprising passing liquefied closed-cycle refrigeration medium being a mixture of nitrogen and hydrocarbons in indirect heat exchange relationship with said air or primary components thereof, and in indirect heat exchang relationship with the cycle medium and wherein the refrigeration value of the closed-cycle medium is produced by compressing said medium, partially condensing compressed medium in several indirect heat exchange stages, passing partial condensates to phase separators, and wherein condensate from each phase separator stage is expanded, reheated, and revaporized in said indirect heat exchange stages countercurrently to the cycle medium being partially condensed, and the revaporized medium is recompressed, the improvement wherein the condensate obtained from the phase separator of the first stage is subdivided into two partial streams; the first of these streams is expanded and then is warmed in indirect heat exchange with closed-cycle medium withdrawn from the compressor thereby partially condensing said closed-cycle medium which is then phase-separated in said first stage phase separator; the second partial stream is expanded and admixed to the condensate obtained from the phase separator of the second stage and is reheated and revaporized together therewith; resultant uncondensed vapor medium recovered from the last serially connected heat exchange stage is engine expanded, and resultant engine-expanded vapor is passed in indirect heat exchange relationship with liquefied air or primary components thereof to subcool same.

4,141,708

DUAL FLASH AND THERMAL ECONOMIZED REFRIGERATION SYSTEM

William J. Lavigne, Jr., Fayetteville, and Louis H. Leonard, DeWitt, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,793
Int. Cl.[2] F25B *5/00, 31/00, 1/10*
U.S. Cl. 62—117 18 Claims



11. A method of cooling a fluid within a refrigeration system utilizing a refrigerant which comprises:

compressing the gaseous refrigerant to increase its temperature and pressure;

condensing the gaseous refrigerant to a liquid refrigerant;

flashing the refrigerant so that part of the liquid refrigerant changes state from a liquid to a gas absorbing heat from the remaining liquid refrigerant;

condensing the gaseous refrigerant from the step of flashing to a liquid;

reflashing the liquid refrigerant in a low temperature flash economizer;

recompressing the flash gas from the step of reflashing;

recondensing the gaseous refrigerant received from the step of recompressing simultaneously with the step of condensing the gaseous refrigerant from the step of flashing; and

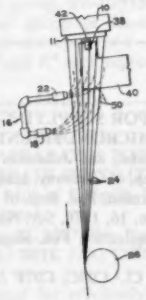
evaporating the liquid refrigerant in a heat exchanger to absorb heat from the liquid to be cooled wherein the refrigerant changes state from a liquid to a gas so that the refrigerant may be cycled to the step of compressing.

4,141,709

BUSHING ENVIRONMENTAL CONTROL

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 14, 1978, Ser. No. 886,489
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 12 Claims



1. In the method of forming continuous glass fibers comprising drawing filaments through a bushing, contacting the filaments with a liquid cooling fluid, gathering the filaments into a strand and collecting the strand the improvement comprising passing cooling air horizontally and downwardly toward the bushing, lifting a portion of the air in an area below the bushing upwardly toward the bushing at a velocity sufficient to entrap a portion of said cooling fluid to thereby create a supersaturated air atmosphere, establishing with the upwardly moving air a supersaturated air atmosphere immediately below the bushing, removing heat from the bushing environment with the supersaturated cooling air atmosphere, and removing and replacing the supersaturated air continously.

4,141,710

METHOD FOR PRODUCING LIGHT CONDUCTING FIBERS

Hubert Aulich, Munich; Hans Pink, Starnberg, and Josef Grabmaier, Kempfenhausen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

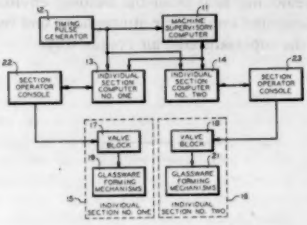
Filed Jul. 15, 1977, Ser. No. 815,911
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1976, 2637937
Int. Cl.[2] C03C *25/02*
U.S. Cl. 65—3 A 9 Claims

1. A method for the production of light conducting fibers, said method comprising providing a glass-like base member of optical material, providing a liquid phase consisting of a water-free solution having compounds of glass forming oxides of at least one element selected from a group consisting of Se, Te, P, As, Si, Ge, Sn, Pb, Ti, B, Al, Mg, Ca, Sr, Ba, Li, Na, K and Rb, at least one of said elements being dissolved in an acid selected from a group consisting of monocarboxylic and dicarboxylic acids, each of said carboxylic acids having no more than four carbon atoms, said solution having a solution medium selected from a group consisting of lower keytones, lower alcohols, esters of lower alcohols with lower carboxylic acid and combinations thereof, each of said solution mediums having no more than 4 carbon atoms, depositing at least one layer from the liquid phase onto a surface of the base member, and subsequently transforming each of said layers into a film of optical material by heating the layer to cause thermal decomposition of each layer into a glass film.

4,141,711
AUTOMATIC PARISON FREEZE FOR A GLASSWARE FORMING MACHINE

Eric R. Zabor, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 10, 1978, Ser. No. 868,352
Int. Cl.² C03B *9/40*
U.S. Cl. 65—29 **14 Claims**



1. A method of obtaining a parison sample from an automatic glassware forming machine which forms articles of glassware during successive cycles of a series of predetermined forming steps by distributing gobs of molten glass to a first forming means; actuating the first forming means for a first portion of the series of predetermined forming steps to form a parison from each of the gobs of molten glass; transferring each parison to a second forming means; and actuating the second forming means for a second portion of the series of predetermined forming steps to form an article of glassware from each of the parisons, the method comprising:

discontinuing the transfer of the parisons from the first forming means to the second forming means after a selected parison has been transferred to the second forming means;

discontinuing the distribution of the gobs of molten glass to the first forming means after the distribution of the next gob following the transfer of said selected parison;

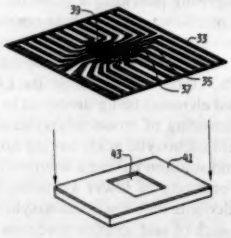
completing the second portion of the series of predetermined forming steps to form an article of glassware from said selected parison; and

extending the time a parison is in the first forming means and discontinuing selected steps in the first portion of the series of predetermined forming steps to freeze a parison formed from said next gob in the first forming means.

4,141,712
MANUFACTURING PROCESS FOR PACKAGE FOR ELECTRONIC DEVICES

Bryant C. Rogers, Escondido, Calif., assignor to Diacon Inc., San Diego, Calif.

Filed Jul. 18, 1977, Ser. No. 816,598
Int. Cl.² C03B *23/20*; C03C *27/02*; B23P *17/00*; H01B *19/00*
U.S. Cl. 65—36 **6 Claims**



1. A method for manufacturing a framework for a package for an electronic component comprising the steps of:

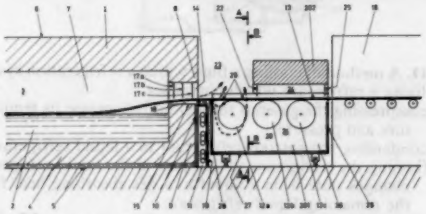
attaching to a package support a leadframe having a plurality of leads extending inwardly from a frame, the inwardmost portion of each lead terminating in a bonding tip, at least some of said bonding tips being interconnected by a bonding tip support which prevents relative motion among the interconnected bonding tips during the attaching step; and

then removing said bonding tip support to yield said framework for said package.

4,141,713
APPARATUS FOR EXTRACTING A GLASS RIBBON FROM THE EGRESS OF A FLOTATION FURNACE

Piero Ammannati, Pisa, Italy, and Jean-Claude Coulon, Chalon sur Saone, France, assignors to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 20, 1977, Ser. No. 789,270
Claims priority, application France, Apr. 23, 1976, 76 12006; Jan. 19, 1977, 77 01385
Int. Cl.² C03B *18/02*
U.S. Cl. 65—182 R **19 Claims**



1. An apparatus for extracting a glass ribbon from an exit of a flotation furnace sized to permit free passage of said glass ribbon from said furnace interior, which apparatus comprises:

(a) a plurality of extraction rollers arranged in succession adjacent the end portion of the flotation furnace for extracting the glass ribbon from said exit, said rollers disposed such that they elevate to create a gap beneath said glass ribbon at said exit whereby gases which combust as they pass through said gap surround said glass ribbon and form a thermal barrier; and

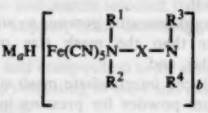
(b) enclosure means arranged adjacent the exit of the flotation furnace for enclosing said rollers, said enclosure means having an opening for receipt of the glass ribbon exiting the flotation furnace and having an opening for passage of the glass ribbon therefrom, said enclosure means also having an opening located above at least the first one of said rollers and adjacent the exit of the flotation furnace for venting said combustion gases to the ambient atomsphere.

4,141,714
FERTILIZERS FOR SUPPLYING PLANTS WITH MICRONUTRIENTS

Volker Mues, Wuppertal, and Johannes Niggemann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,885
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704681
Int. Cl.² C05C; C07F *15/02*
U.S. Cl. 71—27 **33 Claims**

1. A fertilizer composition for supplying plants with the micronutrient iron, comprising an effective amount of at least one prussiate of the general formula



(I)

in which

M represents an alkali metal ion, alkaline earth metal ion, heavy metal ion or ammonium ion or a proton,

R^1, R^2, R^3 and R^4, independently of one another, each represent hydrogen, alkyl, hydroxyalkyl, cycloalkyl, optionally substituted aryl or aralkyl or

R^1, together with R^2, and/or R^3, together with R^4, represent an alkylene group, a bis-alkylene ether group or a bis-alkylene thioether group or, together with the adjacent nitrogen atom, form an unsaturated heterocyclic ring, or

R^2 and R^4 each represent hydrogen, alkyl or hydroxyalkyl and at the same time

R^1 and R^3 together represent an alkylene group,

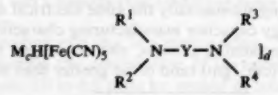
X represents an alkylene group, hydroxyalkylene group, cycloalkylene group, bis-alkylenecycloalkylene group, bis-alkylene ether group, tris-alkylene diether group, bis-alkylene thioether group or bis-alkyleneamino group,

a represents 1 or 2 and

b represents 1, 2, 3 or 4,

or a hydrate of a prussiate of the formula (I), in admixture with a solid or liquefid gaseous diluent or carrier or in admixture with a liquid diluent or carrier containing a surface-active agent.

21. A prussiate of the formula



(I')

in which

M represents an alkali metal ion, alkaline earth metal ion, heavy metal ion or ammonium ion or a proton,

c represents 1 or 2,

d represents 1, 2, 3 or 4,

R^1, R^2, R^3 and R^4, independently of one another, each represent hydrogen, alkyl, hydroxyalkyl, cycloalkyl, optionally substituted aryl or aralkyl, or

R^1, together with R^2, and/or R^3 together with R^4, represent and alkylene, bis-alkylene ether or a bisalkylene thioether group or, together with the adjacent nitrogen atom, for an unsaturated heterocyclic ring, or

R^2 and R^4 each represent hydrogen, alkyl or hydroxyalkyl and at the same time

R^1 and R^3 together represent an alkylene group, and

Y represents an alkylene group, hydroxyalkylene group, cycloalkylene group, bis-alkylenecycloalkylene group, bis-alkylene ether group, tris-alkylene diether group, bis-alkylene thioether group or bis-alkyleneamino group, except that Y does not represent a $-CH_2-CH_2-$ group when R^1, R^2, R^3 and R^4 each represent hydrogen

and their hydrates.

4,141,715

METHOD AND APPARATUS FOR PRODUCING A NITRATE FERTILIZER

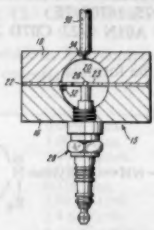
Harold G. Wyse, and Millard S. Smith, both of 3629 N. Dixie Dr., Dayton, Ohio 45414

Filed Apr. 11, 1977, Ser. No. 786,609

Int. Cl.[2] B01K *1/00*; C05C *5/00*

U.S. Cl. 71—58 **11 Claims**

1. A method adapted for efficiently producing a nitrate fertilizer, comprising the steps of forming a first electrode element defining a circular aperture of predetermined diameter, arranging said first electrode element concentrically within the center of a generally spherical air combustion chamber having a diameter larger than the diameter of said aperture, arranging a second electrode element within the center of said aperture, supplying an electrical voltage across said electrode elements to produce an electrical plasma arc therebetween, producing a spiral flow of air within said spherical chamber to effect rotation of the arc within the aperture, directing the



spiral flow of air through the aperture for efficiently generating a nitrogen dioxide gas, introducing the gas from the combustion chamber directly into a flow of water, and directing the water and gas through an elongated tube forming an absorption coil to produce a dilute acid solution usable as a nitrate fertilizer.

4,141,716

METHOD FOR INCREASING YIELD OF SOY BEANS

Christopher H. Cronin, Cambridge, England, assignor to Fisons Limited, England

Continuation-in-part of Ser. No. 655,612, Feb. 5, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,134

Claims priority, application United Kingdom, Feb. 12, 1975, 5905/75; May 27, 1975, 23187/75

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—90 **11 Claims**

1. A method for increasing the yield of a crop of soy beans which comprises applying to the crop, after emergence thereof, an effective amount for increasing said yield, of (3-phenyl-1,2,4-thiadiazol-5-ylthio) acetic acid or the alkali metal, triethylamine, tributylamine, diethanolamine or triethanolamine salt, C_1 to C_{10} alkyl ester or unsubstituted amide thereof.

4,141,717

COMBATING WEEDS IN SOYBEANS

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

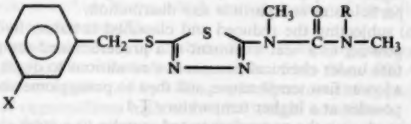
Continuation-in-part of Ser. No. 701,262, Jun. 30, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,489

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—90 **7 Claims**

1. The method of selectively controlling broadleaf weeds in soybean fields comprising applying post-emergently to the plants in said fields an effective amount, sufficient to kill weeds but insufficient to cause substantial permanent injury to soybeans, of a compound having the general structural formula



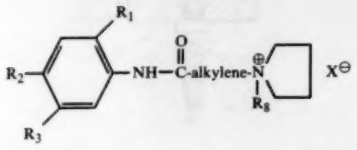
in which X is bromo, fluoro, cyano or trifluoromethyl and R is hydrogen or methyl.

4,141,718
QUATERNARY AMMONIOALKANECARBOXYLIC ACID ANILIDES AS PLANT GROWTH INFLUENCING AGENTS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,616
Claims priority, application Switzerland, Dec. 23, 1975, 16704/75; Dec. 23, 1975, 16705/75
Int. Cl.[2] A01N 9/22; C07D 207/06
U.S. Cl. 71—95 **42 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, chlorine, methyl or trifluoromethyl,

R_2 is methyl, halogen or C_1–C_4 alkoxy,

R_3 is hydrogen, chlorine or trifluoromethyl,

"alkylene" has from 1 to 3 carbon atoms,

R_8 is C_1–C_5 alkyl, cyanomethyl, allyl, butenyl or propargyl, and

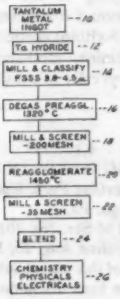
X is the anion of any non-phytotoxic acid.

27. A method for controlling the growth of plants which comprises applying thereto an effective amount of a compound according to claim 1.

4,141,719
TANTALUM METAL POWDER

James B. Hakko, Waukegan, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,558
Int. Cl.[2] B22F 1/04
U.S. Cl. 75—0.5 BB **31 Claims**



1. A method of manufacturing an improved, high-purity agglomerated tantalum powder having relatively low oxygen content, good flow characteristics and high green strength in the absence of a binder, relatively low shrinkage during sintering, and high specific capacitance in pressed anodes after sintering, which consists essentially of:

(a) reducing and classifying hydrided high-purity tantalum ingots to a precursor powder having a predetermined particle size and particle size distribution,

(b) subjecting the reduced and classified tantalum hydride powder to a heat treatment at a predetermined temperature under chemical nonreactive conditions to degas it at a lower first temperature, and then to preagglomerate the powder at a higher temperature T-1,

(c) reducing the preagglomerated powder to a mesh size of less than 80 mesh,

(d) heating the less than 80 mesh powder under non-reactive conditions to a temperature T-2, which is higher than T-1, to reagglomerate it,

(e) reducing the reagglomerated powder to an intermediate mesh size larger than the mesh size of the preagglomerated powder, and

(f) blending the reduced intermediate mesh size powder to provide a tantalum powder for pressing into shapes for sintering to form low density anodes.

4,141,720
TANTALUM POWDER RECLAIMING

Haig Vartanian, Newton, Mass., assignor to NRC, Inc., Newton, Mass.

Filed May 16, 1978, Ser. No. 906,150
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—0.5 BB **6 Claims**

1. Process of reclaiming high capacitance (over 5000 microfarad-volts/gram) tantalum powder which contains high oxygen (e.g. over 2,000 ppm) in the form of unleachable alkali metal tantalates comprising the steps of:

contacting the tantalum powder with a molten salt bath including an alkali metal fluotantalate and also, a metal fluoride content in excess of the fluotantalate content in an amount effective to insure complete wetting of the treated powder,

the weight ratio of treated tantalum to tantalum in the fluotantalate being from 9:1 to 40:1,

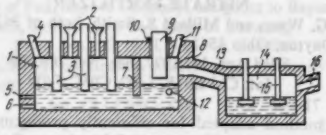
the treatment being at a temperature sufficient to melt the salts and for a time period of 10 minutes to 10 hours,

solidifying the melt and leaching it to remove acid soluble components to thereby produce a low oxygen tantalum powder having substantially the same electrical and powder metallurgy capacitor manufacturing characteristics as before the reclaiming process, and an oxygen (ppm) to surface area (cm^2/gm) ratio of no greater than about 0.5.

4,141,721
METHOD AND APPARATUS FOR COMPLEX CONTINUOUS PROCESSING OF POLYMETALLIC RAW MATERIALS

Jury F. Frolov, ulitsa Muranovskaya, 11, kv. 29, Moscow; Jury F. Piljukov, ulitsa Nemirovicha-Danchenko, 163, kv. 6, Novosibirsk; Vladimir S. Cherednichenko, ulitsa Zorge, 269, kv. 79, Novosibirsk; Gennady I. Orlov, ulitsa Vatutina, 27, kv. 20, Novosibirsk; Igor N. Kurapin, prospekt K. Marxa, 3, kv. 52, Novosibirsk; Roza I. Shabalina, ulitsa Udaltsova, 4, kv. 26, Moscow; Mark M. Lakernik, Strastnoi bulvar, 13a, kv. 32, Moscow; Alexandr F. Gavrilenko, Yaroslavskaya ulitsa, 1/9, kv. 71, Moscow; Anatoly A. Yakovenko, bulvar Rainisa, 14, korpus 2, kv. 73, Moscow; Alla K. Elkina, Ljuberetsky raion, poselok Kosino, ulitsa Polevaya, 11, Moskovskaya oblast; Anatoly I. Golovachev, Otkrytoe shosse, 6, korpus 4, kv. 48, Moscow; Tatyana S. Egorova, ulitsa Mescheryakova, 2, kv. 9, Moscow; Jury M. Vlasov, ulitsa Dosova, 12, kv. 52, Istra Moskovskoi oblasti, all of U.S.S.R.; Matvei Y. Smelyansky, deceased, late of Moscow, U.S.S.R., and by Faina S. Zelichenko, administrator, Uralskaya ulitsa 6, korpus 5, kv. 107, Moscow, U.S.S.R.

Filed Dec. 16, 1976, Ser. No. 751,067
Int. Cl.[2] C22B 4/04
U.S. Cl. 75—14 **9 Claims**



1. A method for continuously processing complex, non-fer-

rous metallic compositions consisting essentially of sulfides and oxides of zinc and metals selected from the group consisting essentially of copper, lead, antimony, and mixtures thereof comprising:

(a) heating said composition in an atmosphere selected from the group consisting of inert and oxidizing atmospheres to form a melt;

(b) reducing said melt by means of a gaseous plasma jet at a temperature of about 4,000 to 5,000° C, while maintaining the temperature of said melt surface at about 1,500 to 1,600° C.

4,141,722

METHOD OF TREATING FERRUGINOUS SLAGS

Kiyoshi Takai, Nishinomiya; Naraharu Yamamoto, Suita, and Seiichi Yamamoto, Osaka, all of Japan, assignors to Osaka Iron & Steel Co., Ltd., Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 761,981
Claims priority, application Japan, Feb. 10, 1976, 51-12795
Int. Cl.[2] C22B *7/04*
U.S. Cl. 75—24 **7 Claims**

1. A method of improving a ferruginous metallurgical slag selected from the class of slags having a chemical composition including metallic iron, 35 to 59 parts by weight calcium oxide, 10 to 18 parts by weight silicon dioxide, 8 to 25 parts by weight total iron and a basicity (CaO/SiO_2) of more than 1.65, which comprises;

(a) providing said slag in a molten state;

(b) adjusting the composition of the molten slag so as to include 2.0 to 8.0 parts by weight of total iron and 7.0 to 18.0 parts by weight Al_2O_3 and a basicity (CaO/SiO_2) of 1.3 - 1.65;

(c) oxidizing metallic iron in the molten slag by blowing an oxygen containing gas into the adjusted molten slag; and

(d) cooling the slag under conditions which yield a lump type slag, whereby the slag is stabilized against dusting and slaking.

4,141,723

PROCESS FOR PRODUCING STAINLESS STEEL

Guy Denier; Pierre Vayssiere, both of Metz; Georges Giroud, Dunkerque, and Jean-Claude Grosjean, Metz, all of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-en-Laye, France

Filed Aug. 30, 1977, Ser. No. 828,994
Claims priority, application France, Sep. 20, 1976, 76 282470
Int. Cl.[2] C21C *5/34*
U.S. Cl. 75—60 **4 Claims**

1. A process for producing stainless steel having a desired chromium content from a molten metal bath initially containing said content of chromium in a converter having a bottom with a tuyere defining a central conduit and a peripheral conduit concentrically surrounding the central conduit, comprising the steps of blowing an oxidizing refining gas through the central conduit into the molten metal bath, the refining gas initially consisting of substantially pure oxygen, subsequently diluting the pure oxygen refining gas by gaseous argon, and injecting liquid argon into the converter through the peripheral conduit, to refine the molten metal bath until it has attained a desired level of carbon.

4,141,724

LOW-COST, HIGH TEMPERATURE OXIDATION-RESISTANT STEEL

Kenneth G. Brickner, O'Hara Township, Allegheny County, and John L. Giove, Churchill Borough, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 21, 1978, Ser. No. 917,624
Int. Cl.[2] C22C *38/28, 38/34*
U.S. Cl. 75—126 D **4 Claims**

1. A low-cost, weldable, high-temperature oxidation resistant steel consisting essentially of:

carbon	0.04% max.
manganese	1.00% max.
phosphorous	0.045% max.
sulfur	0.035% max.
aluminum	0.1% max.
chromium	2.60 to 4.0%
silicon	1.4 to 2.0%
titanium	6 × (C+N)min. to 0.75% max.
molybdenum	0.60% max.
iron	balance plus incidental impurities

4,141,725

ALUMINUM ALLOY FOR GALVANIC ANODE

Tohsuke Murai, Urawa, and Yuichi Tamura, Tokyo, both of Japan, assignors to Nihon Boshoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,571
Claims priority, application Japan, Feb. 14, 1977, 52-14310
Int. Cl.[2] C22C *21/10*
U.S. Cl. 75—146 **4 Claims**

1. An aluminum alloy for a galvanic anode which consists of, in weight percentage:
Zinc from 0.5 to 10.0%,
Indium from 0.005 to 0.050%
Calcium from 0.005 to 0.500%,
magnesium from 0.1 to 4.0%, and
the balance aluminum and impurities.

4,141,726

METHOD FOR PRODUCING COMPOSITE MATERIALS CONSISTING OF CONTINUOUS SILICON CARBIDE FIBERS AND BERYLLIUM

Seishi Yajima, and Masaaki Hamano, both of Oharai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Apr. 4, 1977, Ser. No. 784,316
Int. Cl.[2] B22F *1/00, 3/00*
U.S. Cl. 75—229 **10 Claims**

1. A method for producing beryllium composite materials reinforced with continuous silicon carbide fibers, comprising arranging 5-95% by weight of tightly continuous fibers consisting mainly of silicon carbide obtained by baking spun fibers consisting mainly of organosilicon high molecular weight compound containing at least 0.01% by weight of free carbon a melted matrix consisting mainly of beryllium to react the free carbon contained in the silicon carbide fibers with beryllium to form beryllium carbide and the melted matrix material permeates into spaces between the fibers under vacuum or an inert atmosphere to bond tightly the fibers to the matrix.

8. A beryllium composite material reinforced with continuous silicon carbide fibers, which consists mainly of the following three components,

(a) continuous silicon carbide fibers consisting mainly of β-type silicon carbide fine particles of less than 1,000 A in diameter obtained by baking spun fibers consisting mainly of organosilicon high molecular weight compound,

(b) beryllium matrix selected from the group consisting of beryllium, beryllium alloys and composites consisting mainly of beryllium, and

(c) a very small amount of carbide which is formed by reacting free carbon contained in the surface of the continuous silicon carbide fibers with the matrix beryllium or beryllium alloys.

4,141,727

ELECTRICAL CONTACT MATERIAL AND METHOD OF MAKING THE SAME

Sankichi Shida, Nara; Shinji Okuma, Moriguchi; Mashiro Oita, Kashiwara, and Hyogo Hirohata, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 29, 1977, Ser. No. 855,904

Claims priority, application Japan, Dec. 3, 1976, 51-145789; Dec. 29, 1976, 51-159613

Int. Cl.[2] B22F *3/00*; H01H *1/02*

U.S. Cl. 75—232 **19 Claims**

1. An electrical contact material comprising a metal component as a major ingredient and the remainder being a metal oxide component as a minor ingredient, said metal component consisting essentially of silver with or without tin, and said metal oxide component consisting essentially of bismuth oxide and tin oxide, wherein the amount of the bismuth of said bismuth oxide is 1.5 to 6 weight percent, and the total amount of the tin of said metal component and the tin of said metal oxide component is 0.1 to 6 weight percent, respectively, both on the basis of the sum of said metal component and all the metals of said metal oxide component.

14. A method of making an electrical contact material, comprising: melting a starting metal mixture to a molten alloy, said starting metal mixture consisting essentially of 1.5 to 6 weight percent of bismuth, 0.1 to 6 weight percent of tin, and the remainder of silver; cooling said molten alloy to an alloy ingot; and internally oxidizing bismuth in said alloy ingot to bismuth oxide by heating in an oxidizing atmosphere.

4,141,728

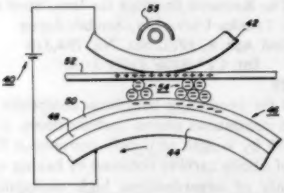
TRANSFER OF DRY DEVELOPED ELECTROSTATIC IMAGE USING PLURAL OPPOSITELY CHARGED FIELDS

Kent W. Hemphill, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 812,870

Int. Cl.[2] G03G *13/16*

U.S. Cl. 96—1.4 **6 Claims**



1. An electrostatic dry imaging process comprising providing a photoreceptor which comprises a support substrate having a photoconductive layer disposed thereon, applying a uniform electrostatic charge to the surface of said photoreceptor so as to produce an electrostatic latent image thereon, developing said latent image with toner particles said toner retaining a triboelectric charge opposite in polarity to the charge of said latent image, contacting said developed image with a transfer member, applying a potential to said transfer member of a polarity opposite to the polarity of the charge on the toner particles, reversing the polarity of the charge on the photoreceptor such that the polarity of said charge is the same as the polarity of the charge of the toner particles and opposite to the polarity of the charge of the transfer member so as to enhance the transfer of the toner particles in imagewise configuration to said transfer member.

4,141,729

1,3,4-OXADIAZOLE DERIVATIVES AND ELECTROPHOTOGRAPHIC PLATES CONTAINING SAME

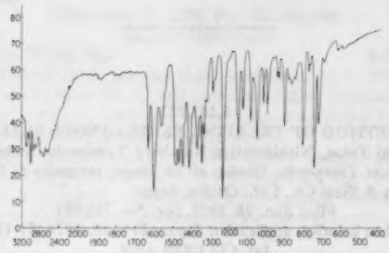
Mitsuo Okazaki, Tama; Akihiro Yamaguchi, Yokohama, and Masaomi Sasaki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 12, 1977, Ser. No. 796,221

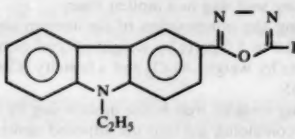
Claims priority, application Japan, May 18, 1976, 51-56830; May 18, 1976, 51-56832

Int. Cl.[2] G03G *5/04, 5/09*

U.S. Cl. 96—1.5 R **28 Claims**

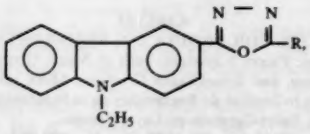


1. An electrophotographic plate comprising an electrically conductive support and a photoconductive layer overlying said electrically conductive support, said photoconductive layer consisting essentially of a mixture of a charge-generating pigment, a compound having the formula



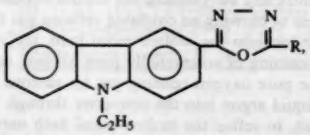
wherein R is diarylamino.

7. An electrophotographic plate comprising an electrically conductive support, a charge-generating layer overlying said electrically conductive support and a charge-transport layer overlying said charge-generating layer, said charge-transport layer consisting essentially of a mixture of a compound having the formula



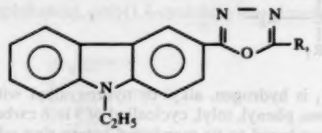
wherein R is diarylamino.

14. An electrophotographic plate comprising an electrically conductive support and a photoconductive layer overlying said electrically conductive support, said photoconductive layer consisting essentially of a mixture of a charge-generating pigment, a compound having the formula



wherein R is dialkylamino in which said alkyl has 1 to 4 carbon atoms, and a binding agent.

19. An electrophotographic plate comprising an electrically conductive support, a charge-generating layer overlying said electrically conductive support and a charge-transport layer overlying said charge-generating layer, said charge-transport layer consisting essentially of a mixture of a compound having the formula



wherein R is dialkylamino in which said alkyl has 1 to 4 carbon atoms, and a binding agent.

4,141,730

MULTILAYER COLOR PHOTOGRAPHIC MATERIALS

Yoshisato Minagawa; Naoki Arai, and Takehiko Ueda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 7, 1976, Ser. No. 674,460

Claims priority, application Japan, Apr. 8, 1975, 50-42541; May 19, 1975, 50-59478

Int. Cl.[2] G03C *7/04, 1/76*

U.S. Cl. 96—9 20 Claims

1. A multilayer color photographic material wherein green-red color mixing is effectively masked by a non-diffusible colored coupling compound which has a maximum absorption in the wavelength region of about 500 mμ to about 600 mμ, which is red before coupling and froms a cyan dye after coupling and provides a low decrease in sensitivity during storage of the photographic material, which photographic material comprises a support having coated thereon one or more red-sensitive silver halide emulsion layers containing a colorless cyan coupler, which, when two or more red-sensitive layers are used, differ in sensitivity, and a green-sensitive silver halide emulsion containing a colorless magenta coupler, said color photographic material having at least one layer having incorporated therein said non-diffusible colored coupling compound so that the optical density of a layer in which the colored coupling compound is present is about 0.05 to about 1.0, which releases upon coupling with the oxidation product of a primary aromatic amino color developing agent a duffusible dye capable of being removed from the photographic layer, said diffusible dye compensating for the green side absorption of the cyan dye, said layer being (1) a non-light-sensitive auxiliary layer disposed between the red-sensitive silver halide emulsion layer and the support; (2) a red-sensitive silver halide emulsion layer having higher relative sensitivity when two or more red-sensitive layers are used, or (3) a non-light-sensitive auxiliary layer disposed between the red-sensitive silver halide emulsion layer and the green-sensitive silver halide emulsion layer, wherein said non-diffusible colored coupling compound is a compound represented by the general formula

[C] — L — [DD]

wherein [C] represents a non-diffusible cyan coupling compound group containing a phenol or α-naphthol nucleus, [DD] represents a diffusible azo, indoaniline or indophenol dye group, which possess a maximum absorption in the wavelength region of about 500 to about 600 mμ, —L— represents a coupling group between the non-diffusible coupling compound group [C] and the diffusible dye group [DD] selected from an imide bond, a carbonyloxy bond, a sulfinyl bond, a sulfonyl bond, an ether bond, an imino bond, a sulfonyloxy bond, a sulfoamido bond, an amido bond, a carbamoyloxy bond, or a thioether bond, and —L—[DD] represents a group which can be released from the compound when the compound undergoes oxidative coupling with said primary aromatic amino color developing agent and which can be removed from the photographic layer during said development, wherein said nondiffusible colored coupling compound is present in an amount of less than 5×10^{-5} mol/m^2 when present in the red-sensitive silver halide emulsion layer (2) having higher relative sensitivity and is present in an amount of about 7×10^{-5} to 20×10^{-5} mol/m^2 when present in said non-light-sensitive auxiliary layer (1) disposed between the red-sensitive silver halide emulsion layer and the support or in said non-light-sensitive auxiliary layer (3) disposed between the red-sensitive silver halide emulsion layer and the green-sensitive silver halide emulsion layer.

4,141,731

METHOD OF CREATING A REPLICATING MATRIX

Manfred H. Jarsen, Encino, Calif., assignor to MCA DiscoVision, Inc., Universal City, Calif.

Division of Ser. No. 402,636, Oct. 1, 1973, abandoned. This application Jan. 2, 1976, Ser. No. 646,053

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—35.1 12 Claims

1. A process of operating upon a substrate body to record video information thereon in the form of a replicating matrix, said process comprising the steps of:

providing a transparent substrate member having an upper surface and a lower surface, and said upper surface being lapped and highly polished, and said lower surface being substantially parallel with said upper surface;

forming an opaque layer over said upper surface;

forming a plurality of successively positioned apertures in said opaque layer for representing the recorded video information and exposing a portion of said upper surface in each aperture;

forming said apertures with a uniform width;

forming a continuous coating of substantially uniformly thick photosensitive material upon the remaining surface of said first layer and said exposed portions of said substrate;

limiting the thickness of said photosensitive material to that substantially the same as the uniform width of said apertures;

exposing that portion of the photosensitive coating positioned upon said upper surface of said substrate to actinic radiation entering through said lower surface and passing through said transparent substrate; and

forming a photoresist bump in each aperture by developing and removing the unexposed portion of said photoresist layer.

4,141,732

COLOR SEPARATED FONT

Thomas L. Byers, 3004 SE. 21, Oklahoma City, Okla. 73115

Continuation-in-part of Ser. No. 780,631, Mar. 23, 1977. This application Jul. 28, 1977, Ser. No. 820,077

Int. Cl.[2] G03C *5/04;* G03B *15/00*

U.S. Cl. 96—41 4 Claims

1. A method of preparing color separated fonts in printing registration, comprising the steps of:

a. providing a positive print of a font;

b. modifying the first character of the font to form at least one supplemental character component capable of being printed in color;

c. forming an overlay for each supplemental component of the first character of the font for printing in color;

d. continuing steps (b) and (c) for the remaining characters of the font;

e. arranging the respective character of the font and its

overlay containing the color separated components on a common plane in predetermined vertically spaced relation

to form a unit in juxtaposition with respect to like units of the remaining characters of the font; and,

f. printing the font units on a transparent film.

4,141,733

DEVELOPMENT OF LIGHT-SENSITIVE QUINONE DIAZIDE COMPOSITIONS

John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,951
Int. Cl.[2] G03C *1/58, 5/22, 5/34, 1/52*
U.S. Cl. 96—49 **13 Claims**

13. In a process for forming a resist image which comprises imagewise exposing to actinic radiation a layer of a light-sensitive quinone diazide composition and developing the exposed layer with an alkaline developing composition, the improvement wherein said alkaline developing composition is an aqueous composition which is substantially free of metal ions and contains a sufficient concentration of methyltriethanol ammonium hydroxide to remove the exposed areas of said layer of light-sensitive quinone diazide composition without substantial removal of the unexposed areas.

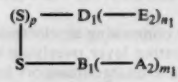
4,141,734

PHOTOGRAPHIC DEVELOPING PROCESS

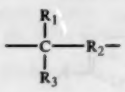
John Lenoir, and Max Marthaler, both of Marly, Switzerland, assignors to Ciba-Geiby AG, Basel, Switzerland

Continuation-in-part of Ser. No. 719,621, Sep. 1, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,389
Claims priority, application Switzerland, Sep. 11, 1975, 11814/75
Int. Cl.[2] G03C *7/00, 5/38, 5/30*
U.S. Cl. 96—53 **18 Claims**

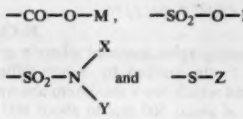
1. Process for developing a photographic material, which contains a silver halide and has been exposed image-wise, using an aqueous preparation which contains (a) a developer for the silver halide, (b) a water-soluble solvent for the silver halide selected from the group consisting of thioethers, thioamides and salts of thiocyanic, sulphurous and thiosulphuric acid or mixtures of these compounds containing as one component a salt of sulphurous acid and (c) as a compounds which avoids the deposition of metallic silver, a compound of divalent sulphur in solution, wherein this sulphur compound corresponds to the formula



in which B_1 and D_1 each denote



wherein R_1 is hydrogen, alkyl or hydroxyalkyl with 1 to 6 carbon atoms, phenyl, tolyl, cycloalkyl of 5 to 6 carbon atoms, or a five-membered to six-membered hetero-ring which contains 1 to 3 nitrogen atoms or 1 oxygen atom or 1 sulphur atom, or is a carboxylic acid group, R_2 is a direct bond or alkylene of 1 to 4 carbon atoms or phenylene, R_3 is hydrogen or alkyl of 1 to 2 carbon atoms or B_1 and D_1 each denote a cycloaliphatic radical of 5 to 6 carbon atoms, phenylene or a heterocyclic 5-membered or 6-membered ring and such ring fused with a further benzene ring, and the hetero-ring contains 1 to 3 nitrogen atoms, an oxygen atom or a sulphur atom, m_1 and n_1 each represent one of the numbers 1, 2 and 3, p represents 1 or 2 and A_2 and E_2 independently of one another each represent a radical of the formulae



in which X and Y in each case are hydrogen or alkyl of at most 8 carbon atoms and is optionally substituted by hydroxyl groups, carboxylic acid groups or sulphonic acid groups and Y also represents a phenylsulphonic acid group, a lower alkylsulphonyl group or a phenylsulphonyl group and M represents a monovalent cation and Z has the meaning of X and Y with the exception of hydrogen.

4,141,735

PROCESS FOR REDUCING CORE-SET CURLING TENDENCY AND CORE-SET CURL OF POLYMERIC FILM ELEMENTS

Robert W. Schrader, and John F. Carroll, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 563,882, Mar. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 457,301, Apr. 2, 1974, abandoned. This application Feb. 18, 1977, Ser. No. 770,128
Int. Cl.[2] G03C *1/52*
U.S. Cl. 96—75 **63 Claims**

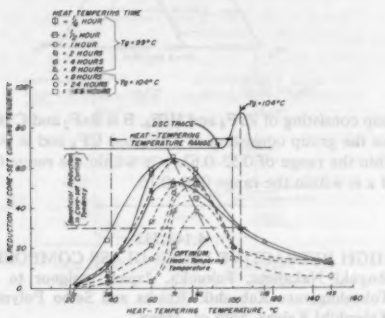
1. A method for heat tempering a self-supporting film having a thickness in the range of about 2 to 50 mils and formed from a thermoplastic polymer having a Tg above about 60° C., determined in a differential scanning calorimeter at a heating rate of 20° K./minute, to reduce the core-set curling tendency of said film without substantially distorting or shrinking said film,

said method comprising maintaining said film for a period of about 0.1 to about 1,500 hours at a temperature of from about 30° C. up to the Tg of said polymer and an ambient relative humidity less than 100% until the core-set curling tendency of said film is reduced at least 15%,

said reduction in core-set curling tendency being measurable as the change in the number of ANSI curl units that the heat-tempered film undergoes upon core-setting on a 3-inch o.d. core at 49° C. and 50% RH for 24 hours, compared to the change in the number of ANSI curl units that the corresponding film which has not been subjected

to said heat-tempering undergoes upon core-setting in the same manner, said ANSI curl units being measured in each instance in accordance with Test Method A, ANSI PH 1.29-1971 with respect to the same reference surface of the film.

59. A multilayered radiation sensitive film element comprising a support and at least one radiation sensitive layer, said support comprising a thermoplastic polymer film having a thickness of about 2 to 10 mils, said polymer being poly(ethylene terephthalate), poly(1,4-cyclohexylene dimethylene terephthalate), or poly(ethylene-2,6-naphthalene dicarboxylate), said film element being characterized in that said polymer film is a heat-tempered film having reduced core-set curling tendency and in that the change in ANSI curl units that said element undergoes upon being maintained in rolled condition for 2200 hours at a temperature of 20° C. and relative humidity (R.H.) up to 50% is ± 14 ANSI curl units, said ANSI curl units being measured at 50% R.H. in accordance with Test Method A ANSI PH 1.29–1971 with reference to the same surface of the film.



4,141,736

PHOTOSENSITIVE COMPOSITE SHEET MATERIAL CONTAINING POLY-2,5-OXOLANE

George Canty, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

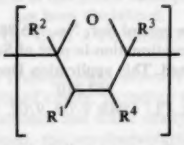
Continuation of Ser. No. 742,879, Nov. 18, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,421
Int. Cl.[2] G03C 1/68
U.S. Cl. 96—87 R 8 Claims

1. A composite sheet material comprising:

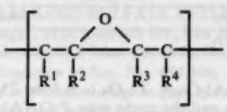
(i) a dimensionally stable substrate;

(ii) a water-insoluble, organic, polymeric coating on at least one surface of said substrate, said coating consisting essentially of

(a) from about 10 to 100 mole percent of blocks of units of the formula

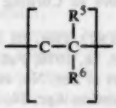


(b) from about 0 to 90 mole percent of blocks of units of the formula



and

(c) from about 0 to 75 mole percent of blocks of units of the formula



wherein R^1, R^2, R^3 and R^4 are individually hydrogen or alkyl groups containing up to 8 carbon atoms each, R^5 is hydrogen or methyl and R^6 is phenyl, cyano or —$COOCH_3$; and

(iii) a layer of a photopolymerizable composition comprising a free-radical initiated, addition polymerizable compound and a photopolymerization initiator.

4,141,737

METHOD OF PREVENTING SURFACE CRACKING OF PORTLAND CEMENT MORTAR AND CONCRETE CONTAINING A FILM FORMING POLYMER MODIFIER

Tag Y. Moon, Midland, and Ronald H. Cooper, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 703,997, Jul. 9, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,328
Int. Cl.[2] C08L 1/28
U.S. Cl. 106—12 4 Claims

1. A method for preventing surface cracking of portland cement mortar or concrete containing a film forming polymeric modifier, the mortar or concrete being subjected to extreme drying conditions such as high wind and/or high temperature combined with low humidity conditions, the method comprising applying onto a fresh, non-cured mortar or concrete surface a substantially continuous coating of from about 0.06 to about 1 lb/yd^2 of said surface of a material selected from the group consisting of polyglycerine, glycerine and mixtures thereof, the coating contains at least 80 weight percent polyglycerin, glycerin or mixtures thereof and up to 20 weight percent of a diluent selected from the group water, methanol, ethanol, isopropanol and glycols.

4,141,738

MELT-FORMED POLYCRYSTALLINE CERAMICS AND DOPANT HOSTS CONTAINING PHOSPHORUS

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 16, 1978, Ser. No. 887,264
Int. Cl.[2] C03C 3/22, 3/16, 3/30
U.S. Cl. 106—39.6 6 Claims

1. A melt-formed polycrystalline ceramic body having an average linear coefficient of thermal expansion of less than 32 × 10^{-7}/° C. over the range from zero to 300° C. and less than 42 × 10^{-7}/° C. over the range from zero to 700° C., said ceramic body having a composition consisting essentially of

Oxide	Mole Percent
P_2O_5	45 - 75
Al_2O_3	11 - 28
Ta_2O_5	6.5 - 13
SiO_2	0 - 20

-continued

Oxide	Mole Percent
La_2O_3	0 - 7

where $P_2O_5 + Al_2O_3 + Ta_2O_5$ is at least 75 mole percent of the composition and the mole ratio P_2O_5/Al_2O_3 is at least 2.

4,141,739

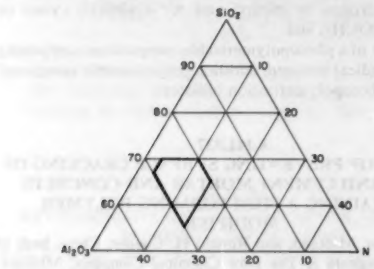
OXYNITRIDE GLASS-CERAMICS

Kenneth Chyung, Painted Post, and Raja R. Wusirika, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 843,872, Oct. 20, 1977, which is a division of Ser. No. 735,313, Oct. 26, 1976, Pat. No. 4,070,198, which is a continuation-in-part of Ser. No. 664,263, Mar. 5, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,355

Int. Cl.[2] C03C *3/22*

U.S. Cl. 106—39.6 **1 Claim**



1. A glass-ceramic article having a crystal content in excess of about 50% by volume, the composition of the article consisting essentially, by weight, of about 55-70%, SiO_2, 20-30% Al_2O_3, and 3.5-15% N, wherein the predominant crystal phase consists of "nitrogen-mullite" solid solution.

4,141,740

SOLID SOLUTION AND PROCESS FOR PRODUCING A SOLID SOLUTION

Ivan B. Cutler, Centerville, Utah, and Patrick D. Miller, Pittsburgh, Pa., assignors to University of Utah, Salt Lake City, Utah

Filed Feb. 23, 1978, Ser. No. 880,414

Int. Cl.[2] C04B *35/52, 35/58*

U.S. Cl. 106—44 **14 Claims**

1. A refractory product comprising a solid solution comprising aluminum nitride, silicon carbide, and aluminum oxycarbide wherein said solid solution comprises at least 1% by weight aluminum nitride and at least 1% by weight aluminum oxycarbide.

4,141,741

COMPOSITIONS OF FLUORIDE GLASSES AND PROCESS FOR MANUFACTURING FLUORIDE GLASSES

Jacques Lucas, Betton; Michel Poulain, Pipriac, and Marcel Poulain, Rennes, all of France, assignors to Etablissement Public dit "Agence Nationale de Valorisation de la Recherche (ANVAR)", Neuilly sur Seine, France

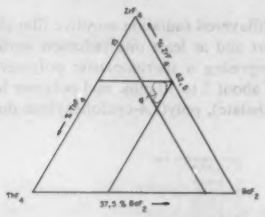
Filed Jun. 10, 1977, Ser. No. 805,420

Claims priority, application France, Jun. 15, 1976, 76 18878; Mar. 24, 1977, 77 09618

Int. Cl.[2] C03C *3/18*

U.S. Cl. 106—47 Q **1 Claim**

1. A fluoride glass which is transparent in the infrared spectrum, said glass being obtained from the ternary combination of three constituents A, B and C, each of which constituents is a fluoride, the vitreous composition being defined by the composition indices x for A, y for B and z for C, in moles per unit mass, with $x + y + z = 1$, in which A is selected from the



group consisting of ZrF_4 and HfF_4, B is BaF_2 and C is selected from the group consisting of ThF_4 and UF_4 and in which x is within the range of 0.52–0.63, y is within the range 0.27–0.38 and z is within the range 0.02–0.15.

4,141,742

HIGH REFRACTIVE INDEX GLASS COMPOSITION

Nobuyuki Nakajima, Fukuoka, Japan, assignor to Fukuoka Tokushugarasu Kabushiki Kaisha and Seibu Polymer Kasei Kabushiki Kaisha, both of, Japan

Filed Jun. 1, 1978, Ser. No. 911,318

Claims priority, application Japan, Jun. 7, 1977, 52-66909

Int. Cl.[2] C03C *3/12, 3/30*

U.S. Cl. 106—47 R **1 Claim**

1. A glass composition having a refractive index of over 2.10 composed of the following metal oxides in weight percent; 40.0 to 54.0% of TiO_2, 24.0 to 44.0% of BaO, 5.0 to 15.0% of ZnO, 3.0 to 13.0% of ZrO_2, 0.2 to 3.0% of CaO, 0.2 to 3.0% of MgO, 0.2 to 2.0% of SiO_2, 0.1 to 0.5% of Na_2O and/or K_2O, and whose total weight exceeds 98.0% and moreover essentially without containing B_2O_3.

4,141,743

THERMAL SPRAY POWDERED COMPOSITE

Donald C. Grubba, Westboro, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 31, 1977, Ser. No. 846,855

Int. Cl.[2] C04B *35/10, 35/12*

U.S. Cl. 106—66 **7 Claims**

1. A complexed chromic oxide composite powder consisting essentially of, by weight, about 40% to 50% Cr_2O_3, about 1 to 10% MgO, about 2 to 10% Fe_2O_3, about 1 to 10% TiO_2, and about 5 to 40% Al_2O_3, and SiO_2 in amounts up to about 8%, said powder including a glassy phase and providing a refractory coating which contains a significant glassy phase and has a Rockwell 15N scale hardness reading in the range of about 84 to 87.

4,141,744

CELLULAR INORGANIC RESIN CEMENTS, AND PROCESS AND COMPOSITIONS FOR FORMING THEM

William L. Prior, Newark, Ohio, and Richard S. Lindstrom, Reading, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 706,885, Jul. 19, 1976, abandoned, and a continuation-in-part of Ser. No. 706,886, Jul. 19, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,310

Int. Cl.[2] C04B *9/00, 9/02, 9/14*

U.S. Cl. 106—105 **82 Claims**

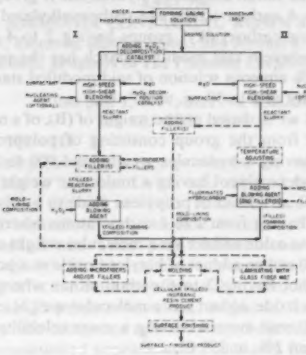
1. A process for forming a cellular inorganic resin cement, comprising the steps of

(a) forming a reactant water slurry of a magnesium salt

selected from magnesium chloride hexahydrate and magnesium sulfate heptahydrate, a water-soluble phosphate and reactive magnesium oxide, the amount of said magnesium salt ranging from about 50% to about 75% by weight of the total weight of said water and said magnesium salt, said slurry having a viscosity ranging between about 700 and 15,000 centipoises;

(b) blending into said slurry at least 0.5% by slurry weight of an anionic water-repellent surfactant;

(c) uniformly dispersing throughout said slurry a blowing



agent, capable of providing a gaseous component either through decomposition or reaction or through vaporization at a temperature below that at which said inorganic resin cement is cured, in an amount required to form said cellular inorganic resin cement with a predetermined density, thereby to provide a foaming composition capable of attaining said predetermined density and final cell structure before said foaming composition gels to form said inorganic resin cement; and

(d) curing said foaming composition under conditions to retain essentially all of its water content.

4,141,745

PROTEINACEOUS ADHESIVE COMPOSITION WITH TETRAHYDROFURFURYL ALCOHOL

Carolyn N. Bye, Cinnaminson, N.J., assignor to National Casein of New Jersey, Riverton, N.J.

Filed Nov. 8, 1976, Ser. No. 739,695

The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.

Int. Cl.[2] C09J *3/24;* C09K *3/28*

U.S. Cl. 106—146 **4 Claims**

1. A substantially homogeneous adhesive composition comprising acid precipitated casein, including solubilizing agents, tetrahydrofurfuryl alcohol and water ready for application to substrates to be joined, the tetrahydrofurfuryl alcohol being present in an amount of about 1.0% to about 20.0% by weight and the casein being present in an amount to supply a protein content of about 13.0% to about 22.9% by weight.

4,141,746

CELLULOSE SULFATE ESTERS

Richard G. Schweiger, 1324 Rimrock Dr., San Jose, Calif. 95120

Division of Ser. No. 669,483, Mar. 23, 1976, Pat. No. 4,035,569, which is a continuation of Ser. No. 487,196, Jul. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, May 25, 1970, Pat. No. 3,702,843. This application Apr. 11, 1977, Ser. No. 786,225

Int. Cl.[2] C08B *5/14;* C08L *1/16*

U.S. Cl. 106—169 **12 Claims**

1. a water-insoluble sulfate ester of cellulose which is swellable in the presence of water;

said sulfate ester being prepared by reacting a nitrite ester of cellulose with sulfur trioxide or a complex thereof at a reaction temperature of about 0° to about 25° C. to obtain a reaction product and reacting said reaction product with a protic solvent to remove residual nitrite ester groups from the reaction product;

said sulfate ester having a degree of substitution of up to about 0.3, and

said sulfate ester groups being substantially uniformly distributed among the polymer units of the cellulose.

2. A water-soluble colloidal sulfate ester of cellulose having a degree of substitution of about 0.3 to about 1.0;

said sulfate ester having a substantially uniform distribution of sulfate ester groups among the polymer units of the cellulose, and

said sulfate ester being compatible and non-gelable in an aqueous medium in the presence of NH_4^+, Na^+, K^+, Mg^{++}, Ca^{++}, Al^{+++}, Zn^{++}, Ni^{++}, Co^{++}, Cu^{++}, Cd^{++}, Fe^{++}, Cr^{+++}, Pb^{++}, Hg^{++}, Ag^+, Sn^{++}, Ba^{++}, Fe^{+++} and Ce^{+++} ions when a volume of a one percent by weight aqueous solution of said ester is admixed with an equal volume of a solution of a salt containing one of said ions with said salt having a concentration in the salt solution of either 20 percent by weight or the salt saturation concentration when the saturation concentration is less than 20 percent by weight.

5. A water soluble colloidal cellulose sulfate ester having a degree of substitution of about 1.0 to about 1.3;

said sulfate ester having a substantially uniform distribution of sulfate ester groups among the polymer units of the cellulose, and

said sulfate ester being compatible and non-gelable in an aqueous medium in the presence of NH_4^+, Na^+, K^+, Mg^{++}, Ca^{++}, Al^{+++}, Zn^{++}, Ni^{++}, Co^{++}, Cu^{++}, Cd^{++}, Fe^{++}, Cr^{+++}, Pb^{++}, Hg^{++}, Ag^+, Sn^{++}, Ba^{++}, Fe^{+++}, and Ce^{+++} ions when a volume of a one percent by weight aqueous solution of said ester is admixed with an equal volume of a solution of a salt containing one of said ions with said salt having a concentration in the salt solution of either 20 percent by weight or the salt saturation concentration when the saturation concentration is less than 20 percent by weight.

9. A water-soluble colloidal cellulose sulfate ester having a degree of substitution of about 1.3 to about 2;

said sulfate ester groups being substantially uniformly distributed among the polymer units of the cellulose, and

said sulfate ester being compatible and non-gelable in an aqueous medium in the presence of NH_4^+, Na^+, K^+, Mg^{++}, Ca^{++}, Al^{+++}, Zn^{++}, Ni^{++}, Co^{++}, Cu^{++}, Cd^{++}, Fe^{++}, Cr^{+++}, Pb^{++}, Ag^+ and Sn^{++} ions when a volume of a one percent mixture by weight aqueous solution of said ester is admixed with an equal volume of a solution of a salt containing one of said ions with said salt having a concentration in the salt solution of either 20 percent by weight or the salt saturation concentration when the saturation concentration is less than 20 percent by weight.

4,141,747

LARGE GRANULE STARCH PROTECTIVE MATERIAL FOR PRESSURE SENSITIVE MICROENCAPSULATED COATINGS

Roland W. Best, Decatur, Ill., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Aug. 4, 1977, Ser. No. 822,013
Int. Cl.[2] C08L *3/02*; C13L *1/08*
U.S. Cl. 106—210 9 Claims

1. An improved method for obtaining a large granule starch product from a native starch having a wide range particle size distribution, said starch being selected from the group consisting of wheat, barley or rye starches, the steps consisting essentially of:

(a) preparing an initial aqueous feed starch slurry at no more than about 15° Bé from a granular starch having a particle size distribution in which at least about 20% by weight of the starch, dry solids basis, is 20–32 microns, about 50–55% by weight of the starch, dry solids basis, is 16–32 microns, and about 45–50% by weight of the starch, dry solids basis, is 2–16 microns;

(b) feeding said initial aqueous feed starch slurry to a first hydrocyclone separator means to at least partially separate the granules into a first aqueous slurry at no more than about 22° Bé containing a higher percentage of larger size starch granules and a second aqueous slurry at no more than about 8° Bé containing a lower percentage of larger size starch granules;

(c) feeding the first aqueous slurry of said first larger starch granules into a second hydrocyclone separator means after first diluting said slurry to a lower Baume to further separate the first aqueous slurry into a large granule starch stream at about 18°–22° Bé and a first recirculation stream at about 3°–5° Bé, said first recirculation stream having starch particle size distribution substantially the same as the initial aqueous feed slurry, said large granule starch stream having a particle size distribution in which at least about 38% by weight of the particles are in the size range of 20–32 microns, and at least about 70% by weight of the particles are in the size range of 16–32 microns;

(d) carefully adding said first recirculation stream to the initial aqueous feed slurry being fed to said first hydrocyclone separator means;

(e) supplying the second aqueous slurry from said first hydrocyclone separator means to a third hydrocyclone separator means to further separate said second aqueous slurry into a by-product stream and a second recirculation stream at no more than about 22° Bé, said second recirculation stream having a starch particle size distribution substantially the same as the initial aqueous feed slurry;

(f) carefully adding said second recirculation stream to the initial aqueous feed slurry being fed to said first hydrocyclone; and

(g) collecting a large granule starch stream from said second hydrocyclone separator means, said large granule starch stream including large granules obtained from said first and second recirculation streams and from the feed starch slurry, said large granule product having a particle size distribution in which at least 38% by weight of said granules are 20–32 microns, and at least 70% by weight of said granules are 16–32 microns.

4,141,748

AEROSOL STARCH COMPOSITION

Kinjiro Matsunaga, Funabashi; Yukiko Sone, Tokyo, and Yunosuke Nakagawa, Koshigaya, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,152
Claims priority, application Japan, Aug. 2, 1976, 51-92690
Int. Cl.[2] C08L *3/08*; C08J *3/02*; C09K *3/30*
U.S. Cl. 106—212 7 Claims

1. In a pressurized container having a discharge valve and charged with a self-propelling composition which can be dispensed in an aerosol mist form when said discharge valve is opened, the improvement which comprises:

said composition consists essentially of

(A) 5 to 30 wt % of a liquified normally gaseous propellant effective for discharging an aerosol of the composition when said discharge valve is opened and

(B) 70 to 95 wt % of a liquid composition consisting essentially of

(i) 2 to 10 wt %, based on the weight of (B), of a modified starch selected from the group consisting of hydroxyalkylated starch containing hydroxyalkyl groups having 2 to 4 carbon atoms and carboxyalkylated starch containing carboxyalkyl groups having 2 to 4 carbon atoms, wherein said modified starch has the property that a 5% aqueous solution of said modified starch has a viscosity of 5 to 30 cp, at 20° C.,

(ii) 0.1 to 2 wt %, based on the weight of (B), of a material selected from the group consisting of polypropylene glycol having a molecular weight of 1,000 to 20,000, polybutylene glycol having a molecular weight of 500 to 10,000, an adduct of propylene oxide to a polyhydric alcohol having from 2 to 6 carbon atoms wherein said propylene oxide adduct has a molecular weight of 1,500 to 10,000 and an adduct of butylene oxide to a polyhydric alcohol having 2 to 6 carbon atoms wherein said butylene oxide adduct has a molecular weight of 1,500 to 10,000, said material having a water solubility of not more than 2%, at 25° C., and

(iii) the balance is water.

4,141,749

OXAZOLINE WAX IMPREGNATED SAUSAGE CASING

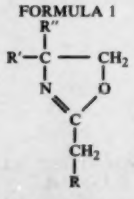
Merrill N. O'Brien, Jr., Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,636
Int. Cl.[2] C08L *1/24*
U.S. Cl. 106—164 8 Claims

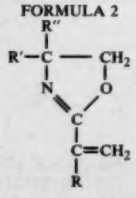
1. In a process for preparing a tubular artifical sausage casing wherein viscose is extruded through a die forming a tubular casing, coagulated, and the cellulose regenerated, the improvement which comprises:

adding an oxazoline wax to the viscose in a proportion of from about 1 – 20% by weight of the cellulose content to the viscose, said oxazoline wax selected from the group consisting of:

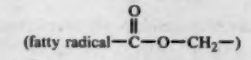
FORMULA 1



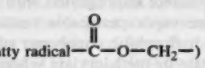
FORMULA 2



wherein R is a fatty acid radical having from 10 – 24 carbon atoms in the structure, R′ is a methylol group, an alkyl group having from 1 – 10 carbon atoms in the structure, or a fatty acid ester radical



with the fatty radical portion having from 10 – 24 carbon atoms and not more than 1 unsaturated group and R″ is a methylol group, an alkyl group having from 1 – 20 carbon atoms, or a fatty acid ester radical



with the fatty radical portion having from 11 - 25 carbon atoms and not more than 1 unsaturated group.

4,141,750

AMMONIA CONTAINING ROSIN SIZES

Ralph W. Emerson, Boston, Mass., and Jerome L. Martin, Terre Haute, Ind., assignors to The Plasmine Corporation, Portland, Me.

Filed Jul. 1, 1977, Ser. No. 812,328
Int. Cl.[2] C08L *93/04*
U.S. Cl. 106—218 **39 Claims**

1. A sizing composition comprising (a) the reaction product of urea and at least one Lewis acid selected from the group consisting of sulfuryl chloride, chlorosulfonic acid, thionyl chloride, benzenesulfonyl chloride, benzenesulfonic acid, ortho-toluenesulfonic acid, para-toluenesulfonic acid, ortho-toluenesulfonyl chloride and para-toluenesulfonyl chloride and (b) sizing effective amounts of rosin that is modified with from about 5 to 50 percent, based on weight of the rosin, of an organic acidic compound selected from the group consisting of an α, β-unsaturated aliphatic acid containing from about 3 to, 6 carbon atoms, an anhydride thereof, and their mixtures, wherein the amount of (a) is sufficient to provide the composition with a total acidity of at least about 1,000 parts per million.

4,141,751

PROCESS FOR PREPARING MODIFIED PARTICULATE AND/OR FIBROUS, CRYSTALLINE AND AMORPHOUS INORGANIC SUBSTANCES

James E. Moreland, Hot Springs, Ark., assignor to Malvern Minerals Company, Hot Springs, Ark.

Continuation-in-part of Ser. No. 625,362, Oct. 24, 1975, abandoned. This application Apr. 13, 1977, Ser. No. 787,090
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.[2] C04B *31/40*
U.S. Cl. 106—308 Q **4 Claims**

1. A process for the preparation of an improved modifier for both polymeric and ceramic compositions, which process comprises:

(a) spraying or pouring between 0.01 and 5 percent by weight of an ambi- or monofunctional treating agent selected from the group consisting of silane coupling agents, titanate coupling agents having the general formula R_3—Ti X, wherein R is a group attached to the titanium in a thermally and hydrolytically stable manner and X is a hydrolyzable group, and glass resin thermoset silicone coupling agents in carrier solutions, onto an essentially dry hydrophilic inorganic solid selected from the group consisting of particulate crystalline inorganic solids, fibrous crystalline inorganic solids, particulate amorphous inorganic solids, and fibrous amorphous inorganic solids, the contact between the treating agent and the inorganic solid being effected while the inorganic solid is agitated in a high intensity mixing apparatus comprising a mixing chamber and a plurality of mixing blades contained therein which are driven at 200–18,000 RPM, at a temperature between about 70° F. and about 350° F.; and

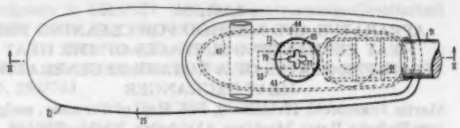
(b) allowing the treating agent and the inorganic solid to remain in situ at a temperature between about 70° F. and about 350° F. for at least about 1 minute.

4,141,752

ORGAN-STIMULATING APPARATUS AND INSULATING SET SCREW FOR SUCH APPARATUS

Frederick J. Shipko, Spring Church, Pa., assignor to Coratomic, Inc., Indiana, Pa.

Filed Jul. 21, 1977, Ser. No. 817,820
Int. Cl.[2] A61N *1/02*
U.S. Cl. 128—419 P **8 Claims**



1. Organ stimulating electrical apparatus to be implanted in a body including a catheter for connecting said apparatus to said organ of said body, said apparatus also including a threaded receptacle into which said catheter extends and a set screw for securing said catheter in said apparatus, the said set screw including:

(a) a threaded member for screwing into the thread of said receptacle and engaging and securing said catheter,

(b) an electrically-insulating head secured to said threaded member and,

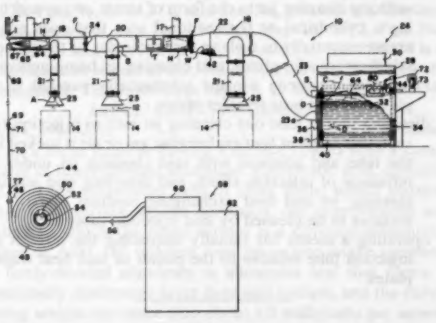
(c) resilient means secured in and extending about, the periphery of said head; said resilient means engaging the wall of said receptacle when said member is screwed into said receptacle to seal said receptacle against the penetration of body fluids.

4,141,753

METHOD AND APPARATUS FOR CLEANING SUCTION DUCTS

Bruce W. Creed, 4379 S. Dye, Swartz Creek, Mich. 48473

Filed Dec. 27, 1976, Ser. No. 754,104
Int. Cl.[2] B08B *3/02, 9/06*
U.S. Cl. 134—8 **10 Claims**



8. A method of in situ cleaning the inside of a suction duct having an upstream inlet and downstream outlet coupled to a vacuum creating system at the downstream end thereof comprising the steps of:

coupling an expansible and contractible member, which is responsive to a differential pressure being created on the opposite upstream and downstream sides thereof to expand to an expanded condition, to the downstream end of a draught line;

placing said expansible and contractible member, in a contracted condition, in said duct at said inlet and applying suction forces to the downstream side of said expansible

and contractible member to cause said member to expand to said expanded condition into intimate engagement with the inside of the suction duct and to move at least said downstream end of said draught line in a downstream path of travel to said outlet; and

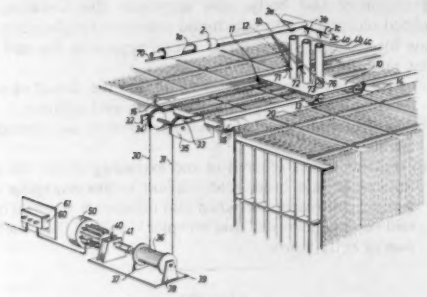
coupling a liquid emitting member to the upstream end of said line and then drawing the upstream end of said line and said liquid emitting means into the upstream end of said duct after the downstream side of said line reaches said outlet.

4,141,754

APPARATUS AND METHOD FOR CLEANING THE HEAT EXCHANGING SURFACES OF THE HEAT TRANSFER PLATES OF A ROTARY REGENERATIVE HEAT EXCHANGER

Martin Frauenfeld, Heidelberg, Fed. Rep. of Germany, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed May 10, 1977, Ser. No. 795,605
Int. Cl.[2] B08B *9/04, 3/00*
U.S. Cl. 134—24 **17 Claims**



1. A method for cleaning the heat exchanging surfaces of the heat transfer plates of a rotary regenerative heat exchanger comprising:

directing nozzles which produce directional jets of a cleaning agent towards the heat exchanging surfaces of the heat transfer plates, said nozzles producing at least one high velocity cleaning jet in the form of steam or gas and having a cylindrical or flat sectional area that does not increase essentially in a plane perpendicular to the plane of said heat transfer plates, said cleaning jet being generated by said nozzles in a plane substantially parallel to the planes of said heat transfer plates;

directing said at least one cleaning jet into an injection tube such that ambient heat exchanging gas or air is sucked into the tube and admixed with said cleaning jet under the influence of injection effect, and directing said admixed cleaning jet and heat exchanging medium towards the surfaces to be cleaned by said injection tube, and

operating a means for radially displacing the nozzles and injection tube relative to the planes of said heat transfer plates.

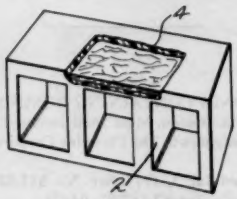
4,141,755

MASONRY CONSTRUCTION MEMBER IMPREGNATED WITH A COPOLYMER OF HYDROXY ALKYL ACRYLATE OR METHACRYLATE WITH LONG CHAIN ALKYL ACRYLATE OR METHACRYLATE

Jonas Weiss, Plainfield, and Richard F. Stockel, Bridgewater Township, Somerset County, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,863
Int. Cl.[2] B08B *7/00*
U.S. Cl. 134—42 **19 Claims**

1. A masonry construction member having at least the major portion thereof exposed to the atmosphere having at least the exterior surface thereof impregnated with a durable, weather resistant, moisture vapor permeable coating of a preformed water insoluble, hydrophilic copolymer of 50 to 98% of hydroxyalkyl acrylate or methacrylate wherein the alkyl group has 2 to 3 carbon atoms with 2 to 50% stearyl acrylate or methacrylate.



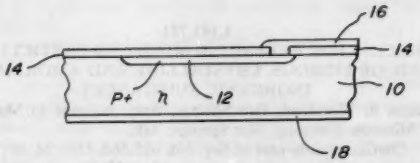
13. A method of removing graffiti from a masonry construction member comprising washing a coated construction member of claim 1 to which graffiti has been applied over said coating.

4,141,756

METHOD OF MAKING A GAP UV PHOTODIODE BY MULTIPLE ION-IMPLANTATIONS

Alice M. Chiang, Weston; Brian W. Denley, Melrose, and Jeffrey C. Gelpey, Peabody, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1977, Ser. No. 842,444
Int. Cl.[2] H01L *33/00, 21/205, 27/14*
U.S. Cl. 148—1.5 **5 Claims**



1. A method of forming an ultraviolet sensitive photodiode comprising:

providing a body of first conductivity type GaP;

forming a region of second conductivity type proximate a first surface of the body by introducing impurities into the body, the region of second conductivity type having a graded impurity distribution therein;

removing a thin layer of the body from the first surface to form an ultraviolet radiation receiving surface; and

making electrical contact to the region of second conductivity type.

4,141,757

UNIFORM THERMOMIGRATION UTILIZING SAMPLE MOVEMENT

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 733,238, Oct. 18, 1976, Pat. No. 4,081,293. This application Nov. 23, 1977, Ser. No. 854,096
Int. Cl.[2] H01L *21/228*
U.S. Cl. 148—1.5 **13 Claims**

1. An improved method for migrating a molten zone through a solid body of semiconductor material comprising the process steps of:

(a) selecting a body of single crystal semiconductor material having two major opposed surfaces, a predetermined type

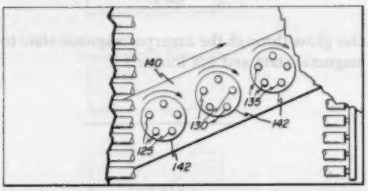
conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least a first major surface, said orientation being one selected from the group consisting of (100), (110) and (111), and a first preferred crystal axis and a central axis, each of which axes being substantially perpendicular to at least the first major surface and substantially parallel with each other;

(b) depositing a layer of a metal of a predetermined thickness and having a predetermined geometrical configuration on the first major surface having the preferred planar orientation;

(c) disposing the body on a supporting surface at a distance remote from the central axis of the supporting surface;

(d) rotating the supporting surface about its central axis;

(e) translating the supporting surface, and the body, through a distance in a plane parallel to a heat source comprising a parallel array of lamps and at an angle of between 30° and 60° to the central axis of said lamp array while simultaneously rotating the supporting surface about its own central axis;



(f) heating the body and the deposited metal to a predetermined elevated temperature with said heat source, said elevated temperature being sufficient to form a melt of a metalrich semiconductor material on the first major surface of the body while continuing the translation of the body;

(g) establishing a temperature gradient substantially parallel with the central axis of the body and the first preferred crystal axis of the crystal structure of the material while continuing the translation of the body, the first major surface on which the melt is formed being at the lower temperature, and

(h) migrating each metal of metal-rich semiconductor material as a molten zone through the solid body of the semiconductor material for a sufficient period of time to reach a predetermined distance into the body from the first major surface while continuing the translation of the body, to form in situ at least one region of recrystallized semiconductor material of the body having solid solubility of the deposited metal therein, a substantially uniform cross-sectional area and a substantially uniform level of resistivity throughout the entire region.

4,141,758

COMPOSITIONS AND PROCESSES FOR PRODUCING CHROMIUM CONVERSION COATINGS ON SURFACES OF ZINC/IRON ALLOY

Wayne C. Glassman, Willowdale; Sydney H. Melbourne, Grimsby; Mary S. Morson, Stoney Creek, and Urmas Soomet, Hamilton, all of Canada, assignors to Dominion Foundries and Steel, Limited, Hamilton, Canada

Filed May 3, 1977, Ser. No. 793,376

Claims priority, application Canada, Jan. 14, 1977, 269791

Int. Cl.[2] C23F *7/26*

U.S. Cl. 148—6.2 **11 Claims**

1. A composition for producing a chromate protective coating on zinc/iron alloy surfaces, the composition having a pH less than 1.20 and consisting of demineralised water, a source of chromium ion, the chromium ion being present in the amount of at least 20 grams per liter and not more than 36.4 grams per liter, a source of perchlorate ion, the perchlorate ion being present in the amount of from 0.4 to 1.2 grams per liter, and a source of fluoride ion, the fluoride ion being present in the amount of from 0.1 to 0.35 grams per liter, the chromium ion being the only metallic ion present therein.

4,141,759

PROCESS FOR THE FORMATION OF AN ANTICORROSIVE, OXIDE LAYER ON MARAGING STEELS

Martin Pfistermeister, Düren-Gürzenich; Heinz Krapf, Selgersdorf, and Erwin Coester, Julich, all of Fed. Rep. of Germany, assignors to URANIT Uran-Isotopentrennungs-Gesellschaft mbH, Julich, Fed. Rep. of Germany

Filed Jan. 20, 1976, Ser. No. 650,759

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1975, 2503763

Int. Cl.[2] C23C *11/10, 11/11*

U.S. Cl. 148—6.35 **8 Claims**

1. In a process for forming an anti-corrosive oxide layer on maraging steel, in which the steel surface is subjected to superheated steam for a period of at least one hour, the improvement comprising heating a clean maraging steel surface to a temperature between 200° C. and 250° C. in a nitrogen, air or oxygen atmosphere in the absence of superheated steam, and then subjecting the heated maraging steel to a further heating period in which a temperature between 450° C. and 520° C. is reached and maintained, with superheated steam under flow conditions in which the flow has a Reynolds number of greater than 900 to form an anti-corrosive oxide layer which is a mixed oxide layer.

4,141,760

STAINLESS STEEL COATED WITH ALUMINUM

Alfonso L. Baldi, Drexel Hill, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 304,220, Nov. 6, 1972, Pat. No. 3,936,539, and Ser. No. 375,616, May 3, 1973, Pat. No. 3,948,687, and Ser. No. 404,665, Oct. 9, 1973, Pat. No. 3,948,689, and Ser. No. 446,473, Feb. 27, 1974, Pat. No. 3,958,046, and Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,047, and Ser. No. 579,945, May 22, 1975, abandoned, said Ser. No. 304,220 is a Continuation-in-part of Ser. No. 219,514, Jan. 20, 1972, Pat. No. 3,801,357, said Ser. No. 357,616 is a Continuation-in-part of Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, said Ser. No. 404,665 is a Continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, said Ser. No. 90,682, and said Ser. No. 219,514 is a Continuation-in-part of Ser. No. 837,811, June 30, 1969, both abandoned. This application Sep. 19, 1975, Ser. No. 614,834

Int. Cl.[2] C23F *7/10*; C23C *9/02*

U.S. Cl. 148—31.5 **5 Claims**

5. In a metal member having a surface coated with a cured mixture of finely-divided aluminum, phosphoric acid, chromic acid, and the magnesium salts of these acids, which mixture protects the surface against corrosion, the improvement according to which the metal surface is a diffusion-aluminized surface of AISI 410 stainless steel jet engine intake member, the finely-divided aluminum is aluminum leaf that forms a substantially continuous layer over said surface, and the cured coating weighs not more than about 1.5 milligrams per square centimeter.

4,141,761

HIGH STRENGTH LOW ALLOY STEEL CONTAINING COLUMBIUM AND TITANIUM

John K. Abraham, Broadview Heights, and Peter J. Vander Arend, Brecksville, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 727,127, Sep. 27, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,248

Int. Cl.[2] C22C *38/06, 38/12, 38/14*

U.S. Cl. 148—36 **18 Claims**

1. A hot rolled, high strength, aluminum killed steel product

as reduced by hot rolling in which the final reduction by such hot deformation is to a finish temperature above 1550° F., said product having yield strength of more than 60 ksi as so produced, and having minimum bendability, in each direction, no higher than 1T for a thickness T of 0.1 inch, said steel consisting essentially of 0.03 to 0..06% C, 0.3 to 0.6% Mn, 0.05 to 0.12% Cb, 0.06 to 0.15% Ti, 0 to less than 0.2% Si, 0.01 to 0.1% Al, and from 0 to the following maximum percentages of the following elements: 0.03 max. P, 0.025 max. S, 0.015 max. N, balance iron and incidental elements.

4,141,762

TWO-PHASE STAINLESS STEEL

Shigehiro Yamaguchi, Fujisawa, and Hisashi Kobayashi, Yokohama, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,115

Claims priority, application Japan, May 15, 1976, 51-55754; May 25, 1976, 51-60392

Int. Cl.[2] C22C *38/06, 38/42, 38/48, 38/58*

U.S. Cl. 148—37 **1 Claim**

1. A two-phase stainless steel composed of 10 to 75% of a ferrite phase and the balance an austenite phase, said steel consisting essentially of:

C = 0.005 to 0.2%
Si = 0.01 to 3.0%
Mn ≦ 15%
P ≦ 0.08%
S ≦ 0.03%
Cr = 15 to 35%
Ni = 10 to 30%
N = 0.01 to 0.4%
Al = 0.06 to 6.0% and

at least one element selected from the group consisting of

Y = 0.01 to 0.09%
Ce = 0.001 to 0.2% and Mg = 0.001 to 0.09%,

and further comprising at least one of

Nb ≦ 2.0%, Mo ≦ 6.0%, Ti ≦ 1.0% and Cu ≦ 3.0%

with the balance Fe and unavoidable impurities and having a reduction of area of between 52% and 63% at 1,000° C.

4,141,763

PROCESS FOR PRODUCTION OF FERROMAGNETIC POWDER AND APPARATUS THEREFOR

Masashi Aonuma; Yasao Tamai; Tatsuji Kitamoto, and Fumio Kodama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 519,713, abandoned. This application Apr. 5, 1977, Ser. No. 784,747

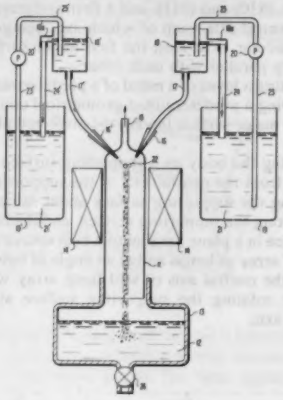
Claims priority, application Japan, Oct. 31, 1973, 48/122541

Int. Cl.[2] H01F *1/06*

U.S. Cl. 148—105 **5 Claims**

1. In a continuous process for the production of a ferromagnetic powder comprising injecting a stream of an aqueous solution of a material capable of forming a ferromagnetic material and a stream of a solution containing a reducing material capable of undergoing an oxidation-reduction reaction with said aqueous solution to produce a ferromagnetic powder into a vertical reaction vessel such that said streams mix and the oxidation-reduction reaction is initiated, and withdrawing hydrogen gas produced during said oxidation-reduction reaction through an exhaust port in the reactor; the improvement which comprises:

applying a magnetic field of at least 50 Oe to the mixed stream at and immediately below the point of confluence but only for the period during which particles are produced by said oxidation-reduction reaction and the particles grow through the superparmagnetic state to the ferromagnetic state and not longer.



4,141,764

PROCESS FOR THE MANUFACTURE OF SILICON OF LARGE SURFACE AREA BONDED TO A SUBSTRATE AND SILICON-BONDED SUBSTRATES SO MADE

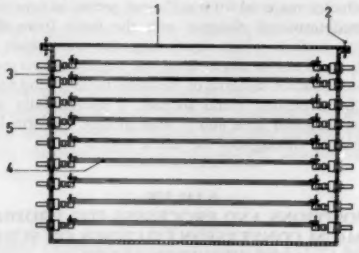
Bernhard Authier; Heinz J. Rath; Dietrich Schmidt, all of Burghausen, and Johann Hofer, Kirchdorf, all of Fed. Rep. of Germany, assignors to Wacker Chemitronic Gesellschaft fur Elektronik-Grundstroffe mbH, Burghausen, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,708

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652218

Int. Cl.[2] H01L *21/223, 21/383*

U.S. Cl. 148—174 **5 Claims**

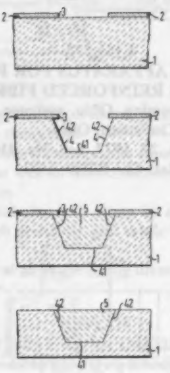


1. A process for the manufacture of silicon of large surface area bonded to a substrate by deposition from the gaseous phase onto panel-shaped substrates, wherein the silicon deposited is converted from its molten state into crystalline form under the influence of a temperature gradient at a right angle to the surface of the substrate, which comprises depositing silicon from decomposition of silicon-containing vapors to a thickness of from 30 to 500 μm onto panel-shaped substrates of glassy carbon that are heated by direct passage of an electric current to a temperature of from 1430° to 1500°C. and thereafter cooling the silicon to a temperature below its melting point in the direction from its free surface towards the substrate.

4,141,765
PROCESS FOR THE PRODUCTION OF EXTREMELY FLAT SILICON TROUGHS BY SELECTIVE ETCHING WITH SUBSEQUENT RATE CONTROLLED EPITAXIAL REFILL

Manfred Druminski, Vaterstetten, and Roland Gessner, Geretsried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 658,277, Feb. 17, 1976, abandoned.
This application Apr. 18, 1978, Ser. No. 897,507
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1975, 2506624
Int. Cl.[2] H01L *21/205, 21/306*
U.S. Cl. 148—175 2 Claims



1. A method of producing a plurality of flat silicon-filled troughs in a silicon substrate of one conductivity type and having a planar surface with a [100]-orientation, comprising the steps of:

(a) forming a mask consisting of a material selected from the group of Si_3N_4 and SiO_2, with windows having peripheral edges substantially parallel to a [110]-orientation so that select areas of such substrate are exposed through such window edges;

(b) subjecting said select areas of the substrate to controlled anisotropic etching conditions which comprise gas etching with an etchant gas containing hydrogen and a halogen at a temperature in the range of about 1150° C. to 1300° C. so that a trough is formed beneath each window, said trough having a base located at a first distance extending below the planar surface of said select substrate areas and substantially parallel to the [100]-orientation of said planar surface, said trough having a plurality of lateral walls extending at an obtuse angle upwardly from said base into contact with a locus on said mask located at a second distance from the peripheral edges of said windows so that edges of said mask overlie portions of said trough, said lateral trough walls having surfaces substantially parallel to a [111]-orientation;

a predetermined ratio being defined between said first and second distances which substantially corresponds to the ratio between the epitaxial growth rate of epitaxially grown silicon in a direction parallel to said trough base and the epitaxial growth rate of epitaxially grown silicon in a direction parallel to said trough walls so that silicon growing parallel to said trough base reaches the window edges substantially simultaneously with silicon growing parallel to said trough walls; and

(c) epitaxially depositing a silicon material of a conductivity type different from that of said substrate within said troughs via a chemical vapor deposition process with a gaseous system selected from the group consisting of $SiCl_4/H_2$ and $SiH_4/HCl/H_2$ at a temperature of about 1150° C. so as to fill said troughs and define a flat planar surface substantially corresponding to the surface of said select substrate areas.

4,141,766
SLURRY EXPLOSIVE COMPOSITION

Ian R. Cameron, Irvine, and John Cooper, Ardrossan, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 2, 1977, Ser. No. 856,983
Claims priority, application United Kingdom, Dec. 29, 1976, 54238/76
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 18 Claims

1. A slurry explosive composition comprising at least one inorganic oxidising salt, a liquid selected from the group consisting of solvents, dispersers and carriers for said salt and, as sensitising fuel, a liquid aliphatic mononitrate containing from 3 to 8 carbon atoms per molecule, said liquid mononitrate being emulsified with the said liquid by means of an emulsifier.

4,141,767
EMULSION BLASTING AGENT

Walter B. Sudweeks, Orem, and Harvey A. Jessop, Lehi, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

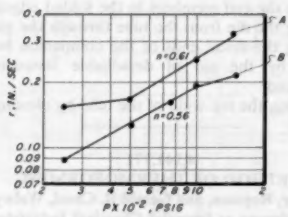
Filed Mar. 3, 1978, Ser. No. 883,077
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 15 Claims

1. In an inverted phase aqueous blasting composition having a water-immiscible liquid organic fuel as a continuous phase, an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase, and an emulsifier; the improvement comprising, as the emulsifier, from about 0.5% to about 5.0% by weight, based on the total composition, of a fatty acid amine or ammonium salt having a chain length ranging from 14 to 22 carbon atoms.

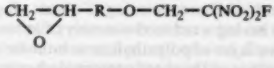
4,141,768
FUEL RICH SOLID PROPELLANT OF BORON AND A FLUORO-NITRO-EPOXIDE POLYMER BINDER

George A. Lo, Canoga Park, and Charles L. Hamermesh, Tarzana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 18, 1970, Ser. No. 48,588
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.3 10 Claims



1. A fuel-rich solid propellant gas generator comprising about 50 to 70% by weight of metallic boron as a fuel and about 30 to 50% by weight of an energetic binder comprising a polymer of a dinitrofluoromethyl epoxide of the formula



wherein R is alkylene of 1 to 4 carbon atoms.

4,141,769
THERMIT COMPOSITIONS

Takayuki Akiyama, Toyokawa, Japan, assignor to Foseco Trading A.G., Switzerland

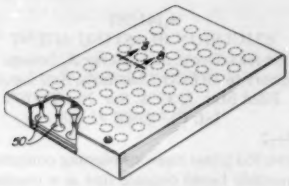
Filed Mar. 4, 1977, Ser. No. 774,367
Claims priority, application Japan, Mar. 4, 1976, 51-23955
Int. Cl.[2] C06B 33/12
U.S. Cl. 149—40 4 Claims

1. In a thermit composition comprising a particulate oxidisable metal, particulate iron oxide and a particulate refractory filler, the improvement that the particulate refractory filler comprises zircon and is present in an amount of 18 to 35 parts by weight per 100 parts by weight of easily oxidisable metal and iron oxide.

4,141,770
METHOD OF MAKING A BAFFLED WATERBED

Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 91733

Filed May 16, 1977, Ser. No. 796,853
Int. Cl.[2] B29D 23/00; A47C 27/08
U.S. Cl. 156—218 3 Claims



1. The process of making a lap welded substantially closed baffled bag which includes:
(a) attaching at longitudinally spaced portions of a sheet of material, corresponding parts of two part baffle structures;
(b) forming a tube by looping the sheet of material so that companion baffle parts are inside;
(c) lap welding the ends of the sheet, but leaving a gap intermediate the ends of the weld so formed;
(d) telescoping the tube over a die having rims at opposite ends spaced from each other substantially less than the designed length of the tube;
(e) placing the end edges of the tube respectively adjacent the rims while gathering the central portion of the tube so that the respective baffle parts fall along opposite sides of the die;
(f) inwardly folding the edges of the tube over the rims;
(g) placing end members over the inwardly folded edges of the tube;
(h) adhering the end members to the folded edges;
(i) removing the die from the tube through the gap;
(j) attaching the distal ends of the companion baffle parts together by the aid of detachable fasteners formed thereon; and
(k) completing the lap weld of the tube by closing said gap.

4,141,771
METHOD OF THERMOFORMING

Peter J. Barker, Royston, and Gerald R. Cheal, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, United Kingdom

Filed Apr. 6, 1977, Ser. No. 785,301
Claims priority, application United Kingdom, Apr. 28, 1976, 17255/76
Int. Cl.[2] B32B 31/20
U.S. Cl. 156—222 8 Claims

1. A method of thermoforming a sheet of poly-(methyl methacrylate) having a reduced viscosity of at least 1.5, carrying a protective layer of polyethylene in intimate contact with at least one surface of the sheet comprising heating the assembly of sheet and its protective layer to a temperature of at least 140° C., until the sheet is in a heat softened condition but insufficiently long for the surface of the sheet to be marred by changes arising in the polyethylene due to the thermal treatment received, subsequently stretching the assembly to a desired shape, whilst the polyethylene remains in intimate contact with the sheet the maximum length of the heating period in minutes is defined by the condition $\log_e$ (Heating Period) is not greater than

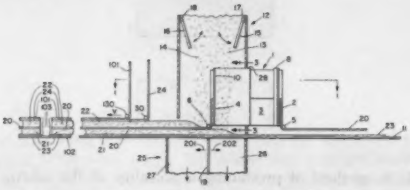
$$(0.2403447^2 - 3.404250T + 20.2842) - (0.0015677^2 - 0.0222875T + 0.105177)X$$

where X is the oven temperature in ° C., T is the thickness of the sheet in millimeters, T is between 3.0 and 8.0 mm and X is between 140° and 200° C.

4,141,772
METHOD AND APPARATUS FOR FORMING A CONTINUOUS REINFORCED FIBROUS WEB

Kenneth B. Buell, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1977, Ser. No. 810,559
Int. Cl.[2] B29D 7/00
U.S. Cl. 156—227 15 Claims



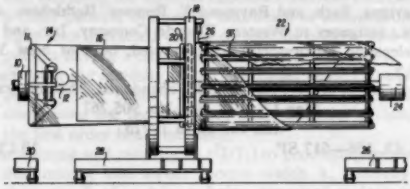
1. A continuous, in-line method for forming an airlaid fibrous fluff web adjacent the uppermost and lowermost surfaces of a substantially planar reinforcing ply having substantially the same width as said fibrous web in a continuous fiber deposition zone, said method comprising the steps of:
(a) continuously feeding said substantially planar reinforcing ply in a first direction in a first plane;
(b) introducing said moving reinforcing ply to a fiber deposition zone while said ply is oriented so that the direction of fiber flow is substantially parallel to the width of said ply to vacuum form the portion of said airlaid fibrous fluff web adjacent the lowermost surface of said reinforcing ply;
(c) guiding said moving reinforcing ply into contact with a first equal length leg portion of the trailing surface of a planar member exhibiting the shape of an isosceles right triangle, said first equal length leg portion being oriented perpendicular to said first direction of travel of said ply;
(d) wrapping said moving reinforcing ply about opposite surfaces of said planar member exhibiting the shape of an isosceles right triangle by passing said ply about the hypotenuse thereof;
(e) restoring said moving ply to said first direction of travel by passing said moving ply about the second equal length leg portion of said planar member exhibiting the shape of an isosceles right triangle, thereby causing said ply to assume a planar condition in a second plane perpendicular to said first plane, said ply being positioned immediately adjacent said first airlaid fibrous fluff web portion;
(f) exposing the uppermost surface of said moving reinforcing ply to said fiber deposition zone while in a planar condition to vacuum form the portion of said airlaid fibrous fluff web adjacent the uppermost surface of said reinforcing ply; and
(g) removing said ply and said airlaid web portions from said fiber deposition zone.

4,141,773

PROCESS AND APPARATUS FOR MANUFACTURING A NON-WOVEN FABRIC AND THE PRODUCT THEREOF

Herbert W. Keuchel, Tallmadge, Ohio, assignor to PNC Company, Akron, Ohio

Filed Feb. 24, 1977, Ser. No. 771,643
Int. Cl.[2] B29C *19/00*
U.S. Cl. 156—244.15 9 Claims



1. A method of providing a thermoplastic web of indeterminate length which comprises
providing a molten thermoplastic foam extrudate;
forming a tubular web of interconnected filaments from said foam extrudate;
advancing said tubular web along its axis;
rotating said web about its axis while it is being advanced; and
slitting said web at an angle to the direction of advancement.

4,141,774

HOT-MELT ADHESIVE COMPOSITION AND PROCESS EMPLOYING SAME

Ken Ando, Ikoma; Minoru Kamosaki, Ohimachi; Yoshinobu Ohya, Amagasaki, and Sigeru Asai, Ohimachi, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation of Ser. No. 616,111. This application Jun. 16, 1977, Ser. No. 807,183
Claims priority, application Japan, Sep. 24, 1974, 49-109785
Int. Cl.[2] C09J *5/00;* C08G *12/04*
U.S. Cl. 156—309 5 Claims

1. A hot melt adhesive consisting essentially of a methoxymethylated nylon terpolymer of nylon 12 : nylon 6 : nylon 66, copolymerized in a weight ratio of 24–45 : 25–45 : 25–45, said nylon terpolymer having a melting point of less than 150° C. and having a methoxymethylation ratio in the range of from 15 to 25%, wherein the methoxymethylation ratio is the ratio of nitrogen atoms bonded to methoxymethyl groups to the total number of nitrogen atoms contained in the nylon terpolymer.

4. A process for adhering together fibrous substrates which comprises placing between said substrates a film of adhesive as claimed in claim 3 and then pressing said substrates together at a pressure of 0.01 to 1 kg/cm^2, at a temperature of 100° to 160° C. for 0.2 to 20 seconds so that said film melts and adhesively secures together said substrates.

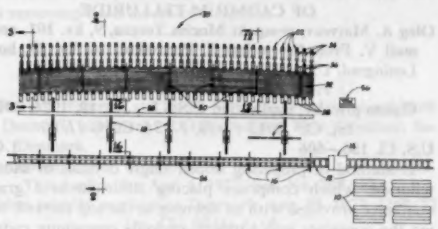
4,141,775

HYDRAULIC BOARD-LAMINATING PRESS

Vernon L. Williams, and Glen A. Westfall, both of Cottage Grove, Oreg., assignors to Bohemia, Inc., Eugene, Oreg.

Filed Aug. 12, 1977, Ser. No. 824,087
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—358 16 Claims

1. A hydraulic board-laminating press for forming laminated wooden beams and the like comprising;
a series of generally laterally aligned closely spaced-apart board-clamping means, extending in a row through a distance substantially co-extensive with the length of a beam to be formed,
each said clamping means including a pair of upwardly opening, parallel, spaced-apart board-clamping jaws with flat clamping faces extending normal to a straight board support surface, one of said jaws of a pair being stationarily mounted and the other jaw of said pair being movable toward and away from the stationary jaw along said support surface,
hydraulic press-operating means for moving the movable jaw of each clamping means between open and closed positions relative to the stationary jaw and for applying a clamping pressure to boards positioned between said jaws of a pair, including a first control means for applying a pre-selected low clamping pressure through said movable jaw, and a second control means for applying a preselected high clamping pressure through said movable jaw,
alignment means spaced at intervals along the length of said



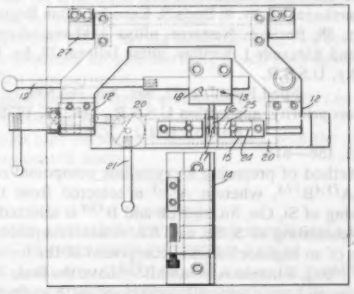
press between adjacent said clamping means for aligning the sides of boards of lumber stacked between the clamping jaw pairs of said press,
said alignment means including a series of alignment bar means, each alignment bar means being positionable between an adjacent pair of said clamping means and parallel to the support surfaces of said clamping means,
and hydraulic pressure operated alignment bar operating means for moving each said alignment bar when in its working position toward and away from the plane of said clamp support surfaces for selectively engaging and applying squaring pressure to the edges of boards lying between the pairs of clamping jaws.

4,141,776

OPTICAL FIBRE SPLICE JIG

George Ellwood, and David G. Dalgoutte, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,295
Claims priority, application United Kingdom, Nov. 10, 1976, 46848/76
Int. Cl.[2] B31F *5/00;* B65N *69/02*
U.S. Cl. 156—502 2 Claims



1. A splicing jig arrangement for butt jointing a pair of optical fibres by the collapsed sleeve technique comprising: a base plate, a coupling sleeve carrier mounted on said base plate via a vertical slide means, first and second fibre support and alignment means each mounted on said base plate via a respective horizontal slide means, and a movable heater means,

mounted on said base plate adapted to raise the temperature of the coupling sleeve above its softening point, said fibre support and alignment means being adapted to secure the fibres to be coupled in axial alignment with one another and in the same vertical plane as the axis of the coupling sleeve when mounted on said sleeve carrier, and said vertical slide means being operable to bring the coupling sleeve into axial alignment with the fibre so as to permit insertion of the fibres into the sleeve by operation of the respective horizontal slide means.

4,141,777

METHOD OF PREPARING DOPED SINGLE CRYSTALS OF CADMIUM TELLURIDE

Oleg A. Matveev, prospekt Morisa Toreza, 9, kv. 101, and Samuil V. Prokofiev, ulitsa S. Perovskoi, 14, kv. 29, both of Leningrad, U.S.S.R.

Filed Jul. 8, 1975, Ser. No. 593,975

Claims priority, application U.S.S.R., Jul. 19, 1974, 2047421

Int. Cl.[2] B01J *17/26, 17/36;* C01G *11/00*

U.S. Cl. 156—606 **1 Claim**

1. Method of preparing doped single crystals of cadmium telluride, which comprises placing tellurium in a graphite container provided with an opening at the top thereof, inserting the container into a quartz ampoule containing cadmium and a chlorine doping element, the quantity of cadmium in the ampoule exceeding that stoichiometrically required for the synthesis of cadmium telluride, evacuating the ampoule, sealing the same and heating at a temperature sufficient for the formation of vapours of cadmium and of the doping element in the ampoule and for the melting of tellurium in the graphite container, whereby as the temperature increases the resulting cadmium vapours penetrate through said opening together with vapours of the doping element and into the inner space of the graphite container to react therein with the vapours and melt of tellurium, thus forming doped cadmium telluride which is converted into liquid phase at the melting point thereof, and subjecting said doped cadmium telluride to directive crystallization at a partial pressure of the vapours of the excess cadmium of from 0.5 to 2 atm with subsequent cooling of the ampoule containing the resulting crystal at a rate not exceeding 15° per hour whereby the resulting crystal has a chlorine doping concentration of 10^{15} to 10^{20} atoms per cubic centimeter.

4,141,778

METHOD OF PREPARING CRYSTALLINE COMPOUNDS $A^{IVA}B^{VIA}$

Georgy A. Domrachev, ulitsa Minina, 15a, kv. 3; Vyacheslav K. Khamylov, ulitsa Pavlovskaya, 16; Mikhail N. Bochkarev, ulitsa Kavalikhinskaya, 72, kv. 177; Boris V. Zhuk, ulitsa Osharskaya, 61, kv. 4; Boris S. Kaverin, ulitsa Bogorodskogo, 8, kv. 58; Boris A. Nesterov, ulitsa Arkhangelskaya, 9a, kv. 20, and Alexandr I. Kirillov, ulitsa Ivlieva, 28, kv. 103, all of Gorky, U.S.S.R.

Filed Feb. 2, 1977, Ser. No. 764,539

Claims priority, application U.S.S.R., Feb. 12, 1976, 2322691

Int. Cl.[2] B01D *17/26*

U.S. Cl. 156—613 **6 Claims**

1. Method of preparing a crystalline compound of the formula $A^{IVA}B^{VIA}$, wherein A^{IVA} is selected from the group consisting of Si, Ge, Sn, and Pb and B^{VIA} is selected from the group consisting of S, Se, and Te, which comprises bringing vapors of an organoelemental compound of the formula $R_kA_l^{IVA}B_m^{VIA}R'_n$, wherein A^{IVA} and B^{VIA} have the same definitions as above and are chemically combined with each other, and wherein R and R' are each selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, k = 0 to 6, l = 1–2, m = 1–4 and n = 0–4, and when l = 1, then m = 1–4 and when l = 2, then m = 1–2 into contact with the surface of a substrate heated to a temperature of 250°–450° C., thus causing thermal decomposition of said organoelemental compound to form said compound $A^{IVA}B^{VIA}$ in crystalline form which remains on the surface of said substrate and volatile products which are removed.

4,141,779

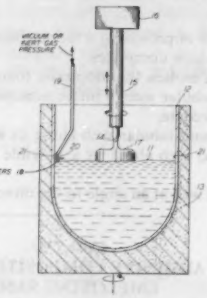
METHOD AND APPARATUS FOR AVOIDING UNDESIRABLE DEPOSITS IN CRYSTAL GROWING OPERATIONS

David W. Hill; Lewis E. Katz, both of Allentown; Robert J. Lavigna, Bath, and Raymond E. Reusser, Bethlehem, all of Pa., assignors to Western Electric Company, Inc. and Bell Telephone Laboratories, Incorporated, both of New York, N.Y.

Continuation of Ser. No. 750,932, abandoned. This application May 12, 1978, Ser. No. 905,267

Int. Cl.[2] B01J *17/18*

U.S. Cl. 156—617 SP **10 Claims**



1. Apparatus for growing crystalline material from a melt comprising:

a crucible for containing a material for making the melt;

means for producing ambient conditions above the melt;

means for heating a given quantity of material in the crucible to a temperature at which it melts;

means for supporting a crystalline body of the material with respect to the melt; and

means, separate from the ambient conditions' producing means and located adjacent to a specific portion of the crucible where undesirable material tends to form, for selectively intensifying perturbation of the ambient conditions at such specific portion which is located above the surface of the melt, sufficiently intense to prevent undesirable formation of material thereupon.

4,141,780

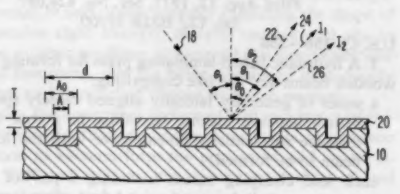
OPTICALLY MONITORING THE THICKNESS OF A DEPOSITING LAYER

Hans P. Kleinknecht, Bergdietikon, and James Kane, Zumikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,189

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—626 **8 Claims**



1. A method of optically monitoring the thickness of a layer

of material being deposited on a substrate within a reaction chamber comprising the steps of:

forming on a body a diffraction grating profile having an aspect groove width A_0 and a periodicity d,

exposing said diffraction grating profile to a beam of monochromatic light while depositing said material on both said substrate and said diffraction grating profile within said reaction chamber, whereby said diffraction grating profile, including the material deposited thereon, functions as a relief pattern, diffracting said beam of monochromatic light into diffracted beams of various orders, said relief pattern having a changing aspect groove width A,

measuring the intensity of the first order beam (I_1) and the second order beam (I_2) to obtain a ratio signal (I_2/I_1) comprising the second order beam intensity divided by the first order beam intensity,

transmitting said ratio signal (I_2/I_1) to processing means for determining said aspect groove width A, whereby the thickness T of said layer being deposited is determined from a pre-established relationship dependent upon the aspect groove width A.

4,141,781

METHOD FOR RAPID REMOVAL OF CORES MADE OF BAl_2O_3 FROM DIRECTIONALLY SOLIDIFIED EUTECTIC AND SUPERALLOY AND SUPERALLOY MATERIALS

Charles D. Greskovich, and Marcus P. Borom, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,991
Int. Cl.² B22D *29/00*
U.S. Cl. 156—637 **7 Claims**

1. A method for removing a core of β-alumina material from a casting comprising the process steps of:

(a) placing the casting containing the core of ceramic material in an autoclave including an aqueous leaching solution containing a material which is one selected from the group consisting of NaOH and KOH;

(b) heating the casting, ceramic material and leaching solution to a temperature of at least about 200° C.;

(c) dissolving substantially all of an interconnecting network of ceramic material formed in situ between grains of the material by sintering by chemical attack caused by the leaching solution, and

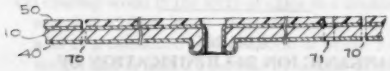
(d) removing at least some of the undissolved ceramic material from the casting by the solution agitated by the chemical reaction.

4,141,782

BUMP CIRCUITS ON TAPE UTILIZING CHEMICAL MILLING

William P. Dugan, Pomona, and Eugene Phillips, Diamond Bar, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Jan. 30, 1978, Ser. No. 873,453
Int. Cl.² C23F *1/02*; B29C *17/08*; H01L *21/306, 21/312*
U.S. Cl. 156—643 **11 Claims**



1. A process for the manufacture of a flexible carrier for use with semiconductor integrated circuit chips and for making connections thereto, said carrier comprising a copper sheet having a lead circuit on one surface thereof and a bump circuit on its opposite side, the copper sheet being gold plated except for desired openings, said process comprising the following steps:

(a) applying a sheet of a polyimide over the lead side of the carrier;

(b) applying respective layers of copper to both sides of the carrier;

(c) applying a layer of a photoresist to the lead side only;

(d) illuminating the photoresist layer through a mask to provide desired openings representing sprocket holes, line separations between adjacent strips, and openings surrounding the bumps in the bump circuit;

(e) developing the photoresist to remove the unexposed photoresist;

(f) chemically milling through the exposed copper, thereby to remove the polyimide; and

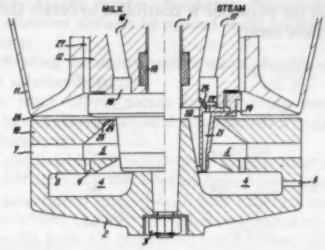
(g) removing both layers of copper.

4,141,783

SPRAY DRYING ATOMIZER WHEEL

Jan Pisecky, Tastrup, and Ib H. Sorensen, Frederikssund, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Sobor, Denmark

Continuation of Ser. No. 390,273, Aug. 21, 1973, abandoned. This application Apr. 6, 1977, Ser. No. 785,147
Claims priority, application Denmark, Aug. 29, 1972, 4269/72
Int. Cl.² B01D *1/18*
U.S. Cl. 159—4 S **4 Claims**



1. An atomizer comprising:

(a) an atomizer wheel having means defining two annular compartments, the wheel further having in its periphery a first set of ejection apertures connected to one of the compartments and a second set of ejection apertures connected to the second compartment, said first set of ejection apertures being constructed in such a way that they are substantially filled with liquid during the operation of the atomizer, the wheel having means for providing fluid communication between the two compartments,

(b) a shaft on which the atomizer wheel is secured,

(c) means for rotating said wheel,

(d) a stationary casing having means defining two concentric ducts annularly around the shaft which both terminate in the first compartment,

(e) an inlet pipe for liquid communicating with one of the concentric ducts, and

(f) an inlet pipe for steam communicating with the other of the concentric ducts.

4,141,784

METHOD AND APPARATUS FOR CONTROLLING WOOD CHIP DIGESTER LEVEL

John E. E. Lofkrantz, Coquitlam, and Andrew B. Isner, Powell River, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Filed May 2, 1977, Ser. No. 792,575
Int. Cl.² D21C *7/06, 7/08, 7/12*
U.S. Cl. 162—17 **7 Claims**

1. In a continuous wood chip downflow digestion system wherein wood chips are fed to the top of the digester and wood pulp is discharged from the bottom of the digester by a rotating

scraper feeding into a blowline having a flow control valve therein, the improvement of a control system comprising,

means for measuring actual level of wood chips at the top of the digester,

means for producing an actual level index from a plurality of individual readings of the actual level over a predetermined time interval,

comparison means for comparing the actual level index with a preset level index and producing an error signal proportional to a deviation of the difference between the actual level index and the preset level index,

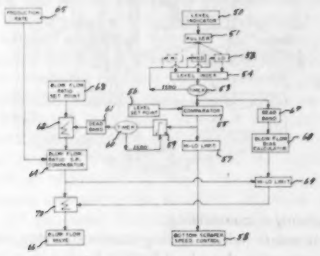
speed control means on the rotating scraper operable within preset limits for adjusting the discharge of wood pulp from the bottom of the digester in accordance with the error signal,

means for integrating the error signal over a predetermined time and for modifying a predetermined blow flow ratio of the feed rate of chips to the flow in the blowline in accordance with said integrated error signal,

means for measuring the feed rate of chips to the digester,

comparator means for comparing the modified blow flow ratio with the measured chip feed rate and for producing an output signal representative of the required blowline flow to proximate the modified blow flow ratio,

means for controlling the flow control valve in the blowline in accordance with the output signal and wherein the chip level in the digester is maintained at a preset level and the flow in the blow line is controlled to obtain the modified blow flow ratio.



7. In the process of continuously digesting wood chips in a downflow digestion system wherein wood chips are fed to the top of a digester and wood pulp is discharged from the bottom of the digester by a rotating scraper feeding into a blowline having a flow control valve therein, the improvement comprising the steps of,

measuring actual level of wood chips at the top of the digester,

producing an actual level index from a plurality of individual readings of the actual level over a predetermined time interval,

comparing the actual level index with a preset level index and producing an error signal proportional to a deviation of the difference between the actual level index and the preset level index,

adjusting rotational speed of the rotating scraper within preset limits in accordance with the error signal,

integrating the error signal over a predetermined time,

modifying a predetermined blow flow ratio of the feed rate of chips to the flow in the flowline in accordance with said integrated error signal,

measuring the feed rate of chips to the digester,

comparing the modified blow flow ratio with the measured chip feed rate,

producing an output signal representative of the required blowline flow to proximate the modified blow flow ratio,

controlling the flow control valve in the blowline in accordance with the output signal and

wherein the chip level in the digester is maintained at a preset level and the flow in the blow line is controlled to obtain the modified blow flow ratio.

4,141,785

PROCESS FOR RECOVERY OF CHEMICALS FROM PULPING WASTE LIQUOR

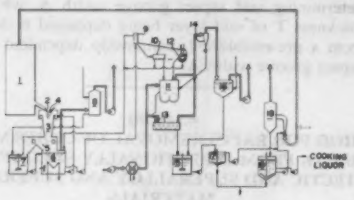
Saburo Mizuguchi; Isao Nomura, both of Tokyo; Takeyuki Naito; Masato Onodera, both of Yokohama, and Kouji Saito, Tokyo, all of Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,551

Claims priority, application Japan, Mar. 17, 1976, 51-28987; Mar. 17, 1976, 51-28988; May 18, 1976, 51-57135; Dec. 27, 1976, 51-156345; Dec. 27, 1976, 51-156346; Dec. 27, 1976, 51-156347

Int. Cl.[2] D21C *11/02*

U.S. Cl. 162—36 **17 Claims**



1. A process for recovery of chemicals from sodium sulfite pulping waste liquor comprising the steps of:

(1) introducing and incompletely dissolving a smelt, obtained by burning a concentrated waste liquor and containing mainly sodium sulfide and sodium carbonate, in a large body of aqueous slurry, which comprises a solid phase the main component of which is sodium carbonate and a liquid phase the main component of which is aqueous sodium sulfide, adding to said body make up water and a weak aqueous slurry recycled from step (2), and supplying a portion of the resulting aqueous slurry to step (2), maintaining the total solid content of said body of aqueous slurry at from about 35 to about 70% by weight, the proportion of sodium carbonate in the total solid material at lower than that of the smelt, and the temperature at from about 55° to about 90° C.

(2) separating the slurry supplied from step (1) into (a) a wet cake containing water in a proportion of from about 10 to about 50% by weight and (b) a weak aqueous slurry, recycling said weak slurry (b) to step (1), and supplying said wet cake (a) to step (3), and

(3) mixing a feed consisting of said wet cake (a) and sufficient additional solid material to adjust the total molar ratio of S/Na_2O of said feed to that of said smelt with hot particles containing sodium sulfite and sodium carbonate while supplying simultaneously a molecular oxygen-containing gas to effect oxidation of sodium sulfide present in said feed into sodium sulfite, wherein said additional solid material is obtained by contacting at least one of a portion of said slurry supplied to step (2) and a portion of said weak aqueous slurry (b) obtained in step (2) with a cooled surface to obtain said solid material.

4,141,786

MANGANIC ION DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL

Robert C. Eckert, Warwick, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 722,957. This application Oct. 25, 1977, Ser. No. 844,553

Int. Cl.[2] D21C *9/10*

U.S. Cl. 162—40 **10 Claims**

1. A process for delignifying lignocellulosic pulps with manganic ion, which comprises the steps of:

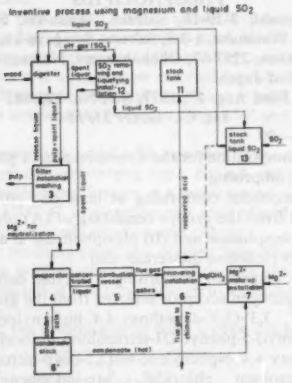
(a) impregnating a lignocellulosic pulp slurry with a water-soluble manganous salt having a manganous ion concentration of from about 1% to about 10%, by weight of oven-dried pulp;
(b) mixing the impregnated pulp slurry with an amount of alkali equal to the stoichiometric quantity of alkali required to precipitate the soluble manganous ion as insoluble manganous hydroxide;
(c) aerating the pulp slurry with an oxygen-containing gas without further addition of alkali and in the absence of alkali for a period of time sufficient to oxidize substantially all of the manganous hydroxide to manganic hydroxide;
(d) acidifying the pulp slurry with sufficient sulfuric acid to lower the slurry pH to at least about 3 to release soluble manganic ions to oxidize the pulp lignins, said manganic ions being reduced to manganous ions by the pulp lignins and forming an effluent containing manganous ions;
(e) separating the effluent containing manganous ions from the pulp slurry with a non-alkaline wash; and then
(f) extracting the oxidized lignins from the pulp slurry with an alkaline solution.

4,141,787

PROCESS FOR PREPARING CHEMICAL CELLULOSE ACCORDING TO THE SULFITE PROCESS BY INCREASING THE TOTAL SO_2 CONTENT OF COOKING ACID WITH LIQUID SO_2 AND DIGESTING WOOD CHIPS

Reinhold Schadler, Aschaffenburg, Fed. Rep. of Germany, assignor to PWA Papierwerke Waldhof-Aschaffenburg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 16, 1975, Ser. No. 613,907
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1974, 2445523
Int. Cl.[2] D21C *1/06, 3/06, 3/08, 3/10*
U.S. Cl. 162—42 **19 Claims**



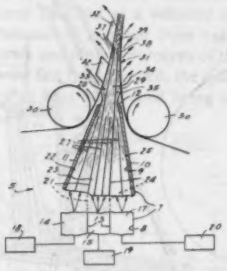
1. A process for preparing chemical cellulose which comprises:
(a) treating wood in the form of chips in a cooking zone for a period of from about 15 to 90 minutes with a cooking acid of a calculated concentration of below 5 percent by weight and at least 2.5 percent by weight SO_2 and a mole ratio of SO_2 to MgO or CaO of from about 2:1 to 3.5:1 at a temperature of from about 45° to 90° C., then;
(b) feeding liquid SO_2 into said cooking zone until the total SO_2 content of the cooking acid is from about 6 to 10 percent by weight;
(c) digesting the treated chips by cooking at a temperature of above 110° C. to obtain a pulp; and
(d) recovering the chemical cellulose from said pulp.

4,141,788

METHOD OF AND MEANS FOR FORMING MULTI-PLY PAPER WEBS FROM A SINGLE HEADBOX

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 2, 1978, Ser. No. 902,116
Int. Cl.[2] D21F *1/02*; D21H *1/06*
U.S. Cl. 162—125 **16 Claims**



1. For use in a machine for making a multi-ply web such as a paper from stocks having a slurry of fibers in a liquid carrier, an assembly comprising:
a headbox having a main chamber communicating with a slice chamber defined by spaced walls leading to a slice opening;
means dividing the main chamber into a plurality of separate stock subchambers;
separate stock supply means for delivering stocks which may have different physical characteristics to each of said subchambers;
at least one flexible self-positionable divider sheet in the slice chamber dividing the slice chamber into separate flow passages aligned respectively with different ones of said headbox main chamber subchambers to receive streams of the stocks from the respective subchambers and maintain the streams separated;
said flow passages leading to said slice opening for discharging the streams in contiguous substantially laminar stock jets from the slice opening into a forming zone defined between convergently cotravelling forming surfaces of the machine;
and a flexible divider extension extending from said divider sheet in free floating relation a substantial distance out of said slice opening in the direction of flow of the stock jets whereby to maintain the stock jets separated for a sufficient interval after leaving the slice opening to permit drainage and partial formation into a ply of the stock delivered by one of the stock jets onto one of the forming surfaces before the stock in a second of the stock jets joins in fiber felting multi-ply laminar relation with the contiguous surface of the partially formed ply.

4,141,789

HEADBOX HAVING PIVOTED BRIDGING COVER

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

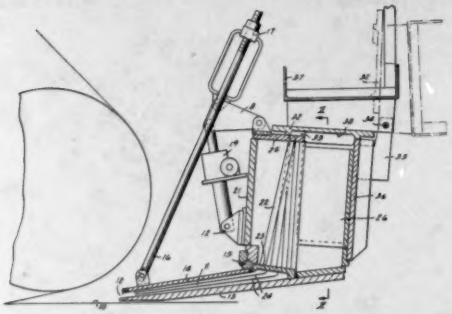
Filed Nov. 22, 1977, Ser. No. 853,901
Int. Cl.[2] D21F *1/02*
U.S. Cl. 162—272 **8 Claims**

1. A headbox for a paper making machine comprising in combination:
a slice chamber having a slice opening for distributing a fibrous stock onto a traveling forming surface;
a distributor chamber means connected to the slice chamber for stock to flow into an upper portion and out of a lower portion thereof into said slice chamber;
a header chamber connected to said distributor chamber means along the width thereof with a lower wall tapering

upwardly to decrease the depth of the header chamber along its width for uniform lateral supply flow along the width of the header chamber;

a paper stock supply conduit for supplying pressurized stock to the larger end of said header chamber;

a horizontal bridging cover extending over the top of said



header chamber and said distributor chamber so that stock flows across beneath said bridging cover from the header chamber to the distributor chamber;

and means for accommodating movement of said cover between a first position wherein said cover extends horizontally over said chambers and a second position where access to said chambers is afforded.

4,141,790

PROCESS FOR THE PREPARATION OF 7-AMINO-CEPHEM COMPOUNDS USING MOLD FUNGI

Tomizo Niwa; Chuhei Nojiri, both of Yokohama; Hitoshi Goi, Chiba; Shinji Miyado, Yokohama; Fumio Kai, Fujisawa; Shigeo Seki, Tokyo; Yujiro Yamada, and Taro Niida, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha Ltd., Japan

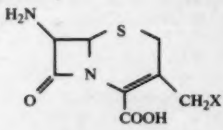
Filed May 12, 1977, Ser. No. 796,194

Claims priority, application Japan, May 24, 1976, 51-59198

Int. Cl.[2] C12D *9/04*

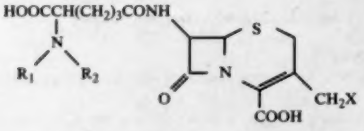
U.S. Cl. 195—29 **8 Claims**

1. Process for the preparation of 7-amino-cephem compounds of the general formula I



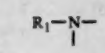
I

wherein X stands for a hydroxyl group, an acetoxy group or a thiosulfuric acid residue, from compounds of the general formula II



II

wherein R_1 stands for hydrogen, a lower alkanoyl group, an arylalkanoyl group, an alkoxycarbonyl group, a lower haloalkoxycarbonyl group, a substituted or unsubstituted aroyl group, a N-arylcarbamoyl group or a substituted or unsubstituted aryl group, R_2 either means hydrogen or forms, together with the



group, a phthalimido group, and X stands for a hydroxyl group, an acetoxy group or a thiosulfuric acid residue, or their metals salts or their salts with organic bases, which process comprises causing the culture of a microorganism selected from the group consisting of Aspergillus sp. MA-13 and Alterneria sp. MA-133 to act on a substrate compound of the general formula II in the presence of an aqueous medium.

4,141,791

MILK COAGULATING MICROBIAL ENZYME

Alessandro Martini, Via della Barca, Frazione Ponte S. Giovanni(Prov. Perugia); Federico Federici, Via Vespucci, Frazione Ferro di Cavallo(Prov. Perugia), and Benito Argenti, Via Tiberina Nord, 1352, Frazione Pieve Pagliaccia (Prov. Perugia), all of Italy

Filed Dec. 27, 1976, Ser. No. 755,389

Int. Cl.[2] C07G *7/02*; A23C *19/02*

U.S. Cl. 195—66 R **4 Claims**

1. A method for preparing a milk coagulating enzyme, comprising the steps of cultivating a yeast selected from the group consisting of *Cryptococcus albidus* species and variants thereof, on a nutrient medium containing at least one assimilable carbon source, at least one source of assimilable nitrogen and inorganic salts, to recover a culture broth containing a substance having a prevailing milk clotting activity and a comparatively low proteolytic activity, and extracting said substance from said culture liquid.

4,141,792

COMPOSITION AND METHOD FOR THE QUANTITATIVE DETERMINATION OF PHOSPHOLIPIDS

Hiroaki Hayashi, 3-19-16, Shirako, Wako-shi, Saitama-ken; Katsuyuki Watanabe, 1-3-8, Sakura, Setagaya-ku, Tokyo, and Toshio Tatano, 2297-67, Ohokahazama, Numazu-shi, Shizuoka-ken, all of Japan

Filed Aug. 17, 1977, Ser. No. 825,482

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—99 **9 Claims**

1. A test composition for the determination of phospholipids in a sample comprising

a first component comprising at least one enzyme group selected from the groups consisting of (A) phospholipase C and phosphatase and (B) phospholipase B and glycerophosphorylcholine diesterase; and

a second component comprising a choline dehydrogenase and a hydrogen acceptor selected from the group consisting of 3,3′-(3,3′-dimethoxy-4,4′-biphenylene)-bis-[2-(p-nitrophenyl)-5-phenyl-2H-tetrazolium chloride],3,3′-(3,3′-dimethoxy-4,4′-biphenylene-bis[2,5-bis(p-nitrophenyl)-2H-tetrazolium chloride], 3-(p-indophenyl-2-(p-nitrophenyl)-5-phenyl-2H-tetrazolium chloride, 2,6-dichlorophenyl-indophenol and nicotinamide adenine dinucleotude.

8. A methode for determining phospholipid content in a sample by hydrolysis according to an enzymatic reaction which comprises adding said sample to a buffer solution containing choline dehydrogenase, a hydrogen acceptor selected from the group consisting of 3,3′-(3,3′-dimethoxy-4,4′-biphenylene)-bis-[2-(p-nitrophenyl)-5-phenyl-2H-tetrazolium chloride], 3,3′-(3,3′-dimethoxy-4,4′-biphenylene-bis [2,5-bis(p-nitrophenyl)-2H-tetrazolium chloride], 3-(p-indophenyl-2-(p-nitrophenyl)-5-phenyl-2H-tetrazolium chloride, 2,6-dichlorophenyl-indophenol and nicotinamide adenine dinucleotide, and at least one enzyme group selected from the groups consisting of

(A) phospholipase D

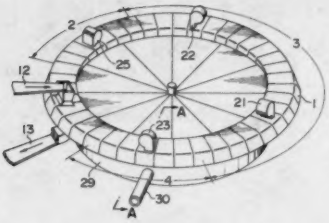
(B) phospholipase C and phosphatase, and
(C) phospholipase B and glycerophosphorylcholine diesterase,
thereby effecting an enzymatic conversion of phospholipids to choline in one step with simultaneous reduction of said hydrogen acceptor to reduced form of acceptor; and thereafter determining colorimetrically at a wave length in the range of 400 to 700 nm the color developed.

4,141,793

PROCESS FOR PREPARATION OF COKE AND CARBONIZER THEREFOR

Yutaka Aoki, Tokyo; Akira Hase, Kawasaki; Jiro Ito, Kamakura, and Hisomu Nagai, Tokyo, all of Japan, assignors to Nissho-Iwai Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,703
Claims priority, application Japan, Nov. 28, 1975, 50-141579
Int. Cl.[2] C10B *1/10, 49/06, 53/08*
U.S. Cl. 201—6 **9 Claims**



5. A process for the preparation of coke which comprises
supplying feed coal to an annular horizontal carbonizer body that includes an annular hearth moving in the horizontal direction below said body and is kept in the sealed and closed state,
heating said feed coal at a temperature between about 150° and about 200° C. in a preheating zone of said carbonizer body using gas taken from the cooling zone referred to hereinafter and heated by an external furnace to a temperature sufficient to heat said feed coal in said preheating zone at a temperature between about 150° and about 200° C.,
heating the preheated coal with a portion of the gas which is taken from the carbonizing zone, cooled, and reheated in an external heating furnace, at a temperature of about 800° to about 1100° C. in a carbonizing zone of said carbonizer body to effect carbonization and coking,
cooling the resulting coke, in a cooling zone of said carbonizer body, with another portion of the gas generated during carbonization and cooled down to an ambient temperature, and
discharging the resulting coke from a coke discharger.

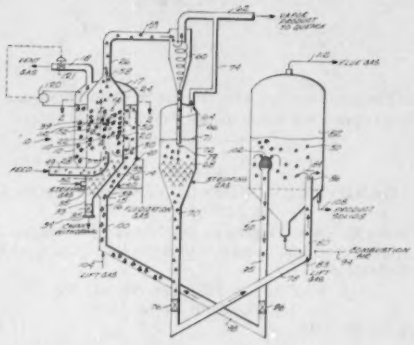
4,141,794

GRID-WALL PYROLYSIS REACTOR

Charles K. Choi, Fullerton, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 700,050, now abandoned. This application Sep. 19, 1977, Ser. No. 834,724
Int. Cl.[2] C10B *49/16, 53/06*
U.S. Cl. 201—12 **29 Claims**

1. In a process for the pyrolysis of solid carbonaceous material in which the carbonaceous material is pyrolyzed by heat transfer thereto from a high temperature, particulate solid source of heat to yield as products of pyrolysis, a pyrolytic vapor and a particulate carbon containing solid residue, an improved method of achieving pyrolysis comprising:
(a) introducing to the base of a fast fluidized bed maintained within a vertically disposed perforated wall chamber of a pyrolysis reaction zone a flow of carbonaceous material contained in a carrier gas which is nondeleteriously reactive with respect to the products of pyrolysis, while simultaneously;
(b) introducing into the fast fluidized bed a pressurized particulate solid source of heat contained in a fluidizing carrier gas which is nondeleteriously reactive with respect to the products of pyrolysis through the perforations inclined to the path of flow of the carbonaceous material in the fast fluidized bed and at a velocity sufficient to prevent the carbonaceous material from caking on the wall and to penetrate and initiate pyrolysis of the carbonaceous material in the fast fluidized bed, the quantity of the particulate source of heat introduced being sufficient to



raise the carbonaceous material to a pyrolysis temperature of at least about 600° F. to yield as products of pyrolysis pyrolytic vapor containing hydrocarbons and carbon containing solid residue;
(c) withdrawing a stream of a gaseous mixture of carrier gas and pyrolytic vapor entraining a solids mixture of particulate source of heat and carbon containing solid residue from the pyrolysis reaction zone through an outlet above the fast fluidized bed;
(d) separating the gaseous mixture from the solids mixture; and
(e) recovering hydrocarbon values from the gaseous mixture.

4,141,795

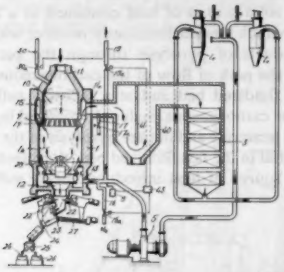
DRY TYPE METHOD FOR QUENCHING COKE

Kunihei Koizumi; Takeshi Ueda, both of Yokohama; Tatu Otani, Yokosuka, and Toshinobu Katata, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 811,128
Claims priority, application Japan, Jul. 6, 1976, 51-79456; Jun. 24, 1977, 52-74525
Int. Cl.[2] C10B *39/02*
U.S. Cl. 201—39 **6 Claims**

1. In a dry type method of quenching coke of the type wherein hot coke discharged from a coke oven battery is charged in a coke quenching installation, and cooling gas comprising a mixture of CO_2, O_2, CO, H_2 and N_2 is circulated through the coke quenching installation through a closed circulating system for cooling the hot coke, the improvement which comprises the steps of analyzing the composition of said circulating cooling gas, supplementing air to the circulating cooling gas on the high temperature discharge side when the CO component thereof increases and supplementing nitrogen gas on the low temperature side to the circulating cooling gas when the H_2 component thereof increases, and discharging a

quantity of the circulating cooling gas from said closed circulating system depending upon the quantity of the air and nitro-



gen gas supplemented whereby the composition of said circulating cooling gas is maintained substantially constant.

4,141,796

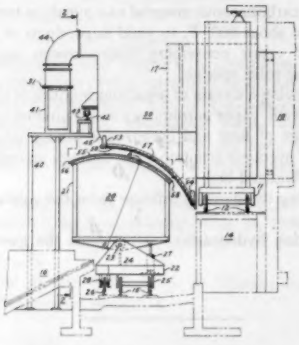
COKE OVEN EMISSION CONTROL METHOD AND APPARATUS

Howard E. Clark, Valparaiso, and Norman D. Hodgson, Westville, both of Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 8, 1977, Ser. No. 822,858

Int. Cl.[2] C10B *39/14, 33/00*

U.S. Cl. 201—39 **11 Claims**



1. Apparatus located on the bench side of a coke oven battery for receiving hot coke pushed from a coke oven in the coke oven battery and transporting the coke to a quench station for quenching and thereafter to a coke wharf for discharging the coke thereon and collecting emissions resulting during the pushing cycle, comprising:

(a) a coke guide mounted on rails for movement along the bench side of the coke oven battery,

(b) a one spot quench car mounted on rails adjacent to the coke guide rails having a coke receptacle thereon with a top opening for admitting the hot coke, with means to tilt the receptacle towards a coke oven to be pushed to a coke receiving position, maintain the receptacle in a vertical upright travel and quench position, and tilt the receptacle towards the coke wharf to a coke discharging position,

(c) a hood structure mounted on the coke guide to enclose the top opening of the quench car and the coke guide when the coke receptacle is in a coke receiving position,

(d) means actuated by the tilting of the coke receptacle to the coke receiving position to sealingly engage the hood structure with the coke receptacle, and

(e) means to collect emissions generated within said hood structure during the pushing of the coke oven.

4,141,797

METHOD OF OPERATING A BATTERY OF COKE OVENS

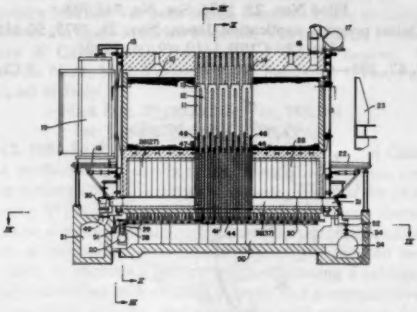
Erich Pries, and Folkard Wackerbarth, both of Bochum, Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H, Bochum, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 748,945

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555692; Feb. 9, 1976, 2604937

Int. Cl.[2] C10B *23/00;* F23N *1/00*

U.S. Cl. 201—41 **6 Claims**



1. A method of operating a battery of coke ovens with a regenerative change of draught on heating flues, the coke ovens including heating walls divided into rows of heating flues arranged alternately between coke oven chambers, said method including the steps of:

establishing a relatively short carbonization time for a high and approximately maximum coke output capacity throughout a continuous coking operation by each coke oven chamber by the steps of:

(a) setting control elements into fixed positions to establish controlled flows of gaseous media in conduits coupled to the heating flues to distribute the flame evolving during combustion within the heating flues for insuring vertically uniform heating of the coking coal within each coke oven chamber;

(b) setting other control elements into fixed positions to establish controlled flows of gaseous media in conduits coupled to the discrete heating flues to distribute combustion media for insuring horizontally uniform heating of coking coal within each coke oven chamber along the length of the heating walls therefor; and

(c) using control elements to produce a selected gas supply rate for the delivery of gas into said heating flues to define at least said relatively short carbonization time; delivering gas always at the selected gas supply rate into the heating flues for combustion during each regenerative half cycle,

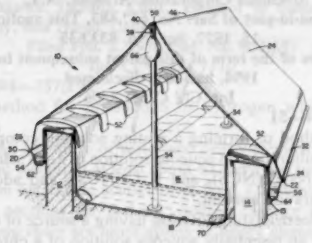
delivering gaseous media while controlled by the fixed positions of said control elements into the heating flues for supporting combustion during each regenerative half cycle, and

interrupting the supply of gas into the rows of heating flues for each coking chamber during each and every regenerative half cycle for a preselected duration of time to obtain a predetermined desired coking time by each coking chamber which coking time is greater than said relatively short carbonization time.

4,141,798
SOLAR STILL

Aristid V. Grosse, Haverford, Pa., assignor to A. & T. Development Corporation, Philadelphia, Pa.

Filed Jan. 30, 1978, Ser. No. 873,721
Int. Cl.[2] B01D *3/00*; C02B *1/06*; F24J *3/02*
U.S. Cl. 202—234 11 Claims



1. A solar still comprising

a pair of parallel dikes of indefinite length separated by a ditch, a first sheet of indefinite length consisting of a water-impervious, opaque material overlying the ditch and pair of parallel dikes, the sheet having a pair of edges arranged substantially parallel to, and outside of, the dikes, said portion of said sheet overlying said ditch defining a container for holding an impure liquid

a second sheet of indefinite length consisting of a water vapor-impervious, at least translucent material overlying the first sheet, the second sheet having a pair of edges arranged coincidentally with said pair of edges of the first sheet, the respective edges of the first and second sheet being bonded together to form a water vapor-impervious seal,

a plurality of vertical columnar supports periodically positioned in spaced relation between the first and second sheets in the center of the ditch, each support extending a substantial distance above the top of the adjacent dikes, and having a notch in the top thereof for receiving filamentary members,

a plurality of filamentary members extending between the tops of adjacent pairs of the vertical columnar supports, the supports and filamentary members acting in consort to maintain the second sheet in spaced relation above the first sheet, the second sheet having a ridge coincident with the supports and filamentary members and angularly depending on either side thereof toward the outer edges of the dikes, and

a plurality of spacing means positioned between the first and second sheets periodically along the top of each dike and extending slightly outward therefrom for maintaining a spaced relationship between the first and second sheets at the outer edges of the pair of dikes, the joined first and second sheets forming a trough on the outside of each dike said troughs defining a container for receiving and holding purified distilled liquid.

4,141,799
PROCESS FOR THE PURIFICATION OF HIGH-MELTING ORGANIC PRODUCTS

Bernd Thelen, Leverkusen; Hans-Walter Brandt, Odenthal; Wolfgang Auge, and Karl-Werner Thiem, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

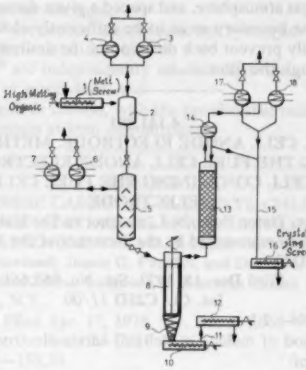
Filed Aug. 12, 1977, Ser. No. 824,198
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637689
Int. Cl.[2] B01D *1/22, 3/14*
U.S. Cl. 203—48 13 Claims

1. Process for the purification of high-melting organic products, which comprises

(a) melting the product to be purified by heating, while mechanically conveying the same along a path with a screw conveyer,

(b) degassing the melt at a reduced pressure in a column,

(c) passing the degassed melt through a thin film evaporator at a reduced pressure to evaporate the high-melting organic product, passing the vapors produced in the thin film evaporator through a rectifying column and discharging the remaining high-boiling impurities and such impurities which are not capable of being distilled from



the evaporator through a conically tapering sump, while mechanically scraping residue from the sump wall,

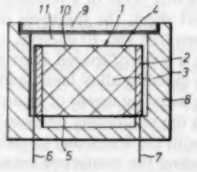
(d) said discharging being effected into and through an enclosed path at a rate sufficient to prevent liquid accumulation in the sump, while maintaining the central portion of the enclosed discharge path at a lower temperature than its end portions to form a crystal sludge in this central portion, which acts as a pressure seal, and

(e) solidifying and recovering the product discharging from said path.

4,141,800
ELECTROCHEMICAL GAS DETECTOR AND METHOD OF USING SAME

Wolfram Breuer; Wolf-Jürgen Becker, both of Leverkusen; Jacques Deprez, Frechen; Eckard Drope, Cologne, and Hans-Joachim Schmauch, Bl'echer, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 791,126
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621676
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T 17 Claims



1. In an electrochemical gas detector for the detection of gas traces, means defining a gas chamber in communication with the atmosphere to be detected and an electrolytic measurement cell having a normally solid organic electrolyte adjacent to the gas chamber along a three phase boundary and electrodes on opposite sides thereof and wherein the gas component to be

detected diffuses out of the gas chamber to the three-phase boundary to effect a change in the electrochemical equilibrium resulting in a measurable electrical current in the electrodes, wherein the electrolyte comprises an anhydrous organic gel, which at temperatures of up to 60° has a vapor pressure of less than 1 Torr, and wherein the means defining the gas chamber comprises a partly sealed cavity and a sorption filter through which the gas chamber is in communication with the atmosphere to be detected, the filter being selectively permeable to the desired gas component to be detected with respect to the detected gas atmosphere, and spaced a given distance from the three phase boundary so as to be sufficiently close thereto to substantially prevent back diffusion of the desired gas component through the filter.

4,141,801

FUEL CELL ANODE ELECTRODE, METHOD OF MAKING THE FUEL CELL ANODE ELECTRODE, AND FUEL CELL CONTAINING THE FUEL CELL ANODE ELECTRODE

John Perry, Tinton Falls, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1977, Ser. No. 860,661
Int. Cl.[2] C25D *11/00*
U.S. Cl. 204—2.1 **9 Claims**

1. Method of making a fuel cell anode electrode including the steps of:

(a) pressing a paste mix of noble metal powder, graphite powder and teflon onto a screen current collector to form an electrode,

(b) drying the electrode,

(c) cathodically charging the electrode at a current density of about 2.5 to about 10 mA/cm^2 for about 2 to about 6 minutes to deposit lead through electrolysis using a saturated solution of lead chloride,

(d) anodically charging the electrode for about 2 to about 12 minutes to oxidize the lead to lead dioxide, and

(e) washing the electrode with distilled water and then drying.

4,141,802

FIBRE-REINFORCED METAL PANELS AND PRODUCTION THEREOF

Daniel A. Duparque, Ballancourt; André A. Grange, Vert le Petit; Daniel L. Morin, Evry, and Marius F. Leclercq, Lagny, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 23, 1976, Ser. No. 753,800
Claims priority, application France, Dec. 31, 1975, 75 40208
Int. Cl.[2] B05D *3/06*
U.S. Cl. 204—15 **12 Claims**

1. A process for the production of a panel, which comprises the steps of:

(i) depositing a thin layer of a bonding metal or alloy on a metal support sheet, the thickness of the bonding layer being between 0.05 and 10 microns,

(ii) positioning a layer of spaced apart reinforcing fibres on the bonding metal or alloy layer, and

(iii) spraying a metal by means of an arc plasma torch on to and through the reinforcing fibres to form a metal matrix reinforced with the fibres, and to melt the bonding metal, thereby bonding the reinforced metal matrix to the support sheet.

2. A process according to claim **1**, wherein the deposition of said bonding metal or alloy layer is effected by pad electrolysis.

10. The process according to claim **1** wherein the metal powder being sprayed onto the reinforcing fibers in step (iii) has a melting point above the melting point of the support sheet.

4,141,803

METHOD AND COMPOSITION FOR ELECTROPLATING CHROMIUM AND ITS ALLOYS AND THE METHOD OF MANUFACTURE OF THE COMPOSITION

Donald J. Barclay, Olivers Battery, and William M. Morgan, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 637,483. This application Sep. 15, 1977, Ser. No. 833,635
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.[2] C25D *3/06*
U.S. Cl. 204—51 **16 Claims**

1. A method of forming a plating solution comprising the steps of equilibrating an aqueous solution of a salt selected from the group $Na_3Cr(NCS)_6$ and $K_3Cr(NCS)_6$ and adding boric acid in saturation amount.

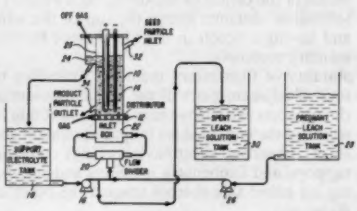
12. An electroplating solution having a source of chromium comprising an essentially aqueous solution of a chromium III thiocyanate complex, the ratio of total chromium III to total thiocyanate being 1:6, the concentration of the chromium being at least 0.05 M and the thiocyanate being at least 0.30 M, and a salt in effective amount to increase electrical conductivity.

4,141,804

PROCESS FOR ELECTROWINNING METAL FROM METAL BEARING SOLUTIONS

Michael M. Avedesian, Beaconsfield, and Anthony P. Holko, Mount Royal, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed May 4, 1977, Ser. No. 793,776
Claims priority, application Canada, May 11, 1976, 252269
Int. Cl.[2] C25C *1/12, 1/22*; C25D *21/10*
U.S. Cl. 204—105 R **5 Claims**



1. A process for electrowinning metal from metal bearing solutions using at least one electrochemical cell having a porous grid supporting a bed of particulate conducting particles comprising:

(a) continuously recirculating a support solution of predetermined metal concentration through said porous grid at a sufficiently high flow rate so as to fluidize and expand the bed by about 5 to 25%;

(b) continuously feeding gas through the bed of particulate conducting particles at a flow rate such as to contract the bed and operate the bed at low expansion between 5 and 25% while creating an intense particle agitation to maintain good mixing and uniform fluidization of the bed of particles;

(c) passing electricity through the bed by immersing into the bed at least one cathode feeder electrode in physical contact with the fluidized bed particles to make the particles cathodic and so cause the metal ions to deposit on the particles, and at least one anode electrode separated from the cathodic particles by a membrane which allows the free passage of ions but prevents physical contact with the particles; and

(d) adding small seed particles to the bed and withdrawing

large product particles from the bed to make the process continuous or semicontinuous.

4,141,805

PRODUCTION OF HYDROGEN

Tihiro Ohkawa, LaJolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Feb. 5, 1976, Ser. No. 655,387

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 H **12 Claims**

1. A method for production of hydrogen which method comprises

providing a mixture of water and heavy elements having an atomic weight of at least about 40 and a fast neutron cross section for elastic scatter of at least 1.5 barns and lesser cross sections for inelastic scatter, capture and fission, wherein there are more atoms of heavy elements present than there are molecules of water,

bombarding said mixture in a reaction zone with fast neutrons so as to cause thermal dissociation of said water to produce hydrogen ions following elastic collision of said fast neutrons with said heavy elements, and

combining said hydrogen ions within said reaction zone to prevent their recombination to water.

4,141,806

BULK PHOTO POLYMERIZATION PROCESS FOR ESTERS OF ACRYLIC AND METHACRYLIC ACIDS

Berthold Keggenhoff; Hans J. Rosenkranz, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 3, 1977, Ser. No. 756,060

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600318

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.22 **4 Claims**

1. A process for the bulk polymerization of a monomer composition containing at least one ester selected from the group consisting of esters of acrylic acid and esters of methacrylic acid, said process comprising polymerizing the monomer composition in the presence of from 0 to 10% by weight of a photo initiator by irradiation with UV light.

(a) in a first reaction stage at a temperature at or below the boiling point of the reaction mixture up to a conversion of 40 to 80% by weight based on total monomer, and

(b) in a second reaction stage at a temperature which is from 20 to 120° C. above the temperature of the first reaction stage and which is also above the transition temperature of the resulting polymer up to a conversion of more than 90% by weight, based on total monomer.

4,141,807

PHOTOPOLYMERIZABLE COMPOSITION STABILIZED WITH NITROGEN-CONTAINING AROMATIC COMPOUNDS

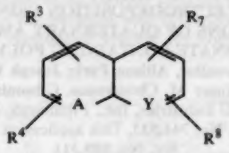
Francis A. Via, Yorktown Hts., N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 1, 1977, Ser. No. 773,370

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **22 Claims**

1. A process for preparing a photopolymerizable composition comprising forming a mixture containing a photopolymerizable ethylenically unsaturated compound, a benzoin ether in an amount sufficient to initiate photopolymerization and a stabilizing amount of a stabilizer having the formula:



wherein

A is carbon or nitrogen;

R^3 and R^4 are independently selected hydrogen, hydroxyl, or an alkali metal salt thereof;

R^7 and R^8 are independently selected hydrogen, hydroxyl, nitroso or pyridylazo; and

Y is nitrogen or carbon, with the proviso that said stabilizer must contain at least one nitrogen.

4,141,808

MANGANESE CARBONYL-SULFONYL CHLORIDE PHOTOINITIATORS FOR RADIATION POLYMERIZABLE UNSATURATED COMPOUNDS

Gordon C. Newland; James G. Pacifici, and David A. Young, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 17, 1978, Ser. No. 897,065

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.24 **4 Claims**

1. A photocurable composition comprising a photopolymerizable unsaturated material having admixed therewith, as a photoinitiator, from about 0.05 to about 5.0% by weight of manganese carbonyl based on total composition weight, and from about 0.05 to about 20.0% by weight based on total composition weight of a sulfonyl chloride compound of the formula R—SO_2Cl wherein R is selected from straight or branched chain or cyclic alkyl of 1–20 carbons, aryl of of 6–14 carbons, and aralkyl of 6–14 carbons in the aryl moiety and of 1–2 carbons in the alkyl moiety, and wherein R may be substituted with up to 5 groups selected from Cl, Br, F, alkoxy of 1–6 carbons, alkyl of 1–4 carbons, NO_2, CN, —SO_2Cl, —SO_2F, and $COOR^1$ wherein R^1 is selected from hydrogen and alkyl of 1–6 carbons.

4,141,809

SEPARATION PROCESS

Gordon F. Aitchison, Abingdon, and Patrick Mattock, Eynsham, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 31, 1978, Ser. No. 929,681

Claims priority, application United Kingdom, Aug. 17, 1977, 34599/77

Int. Cl.[2] G01N *27/26*

U.S. Cl. 204—180 R **4 Claims**

1. A process for the purification and/or separation by continuous flow electrophoresis of an aqueous solution containing components of different electrophoretic mobilities, which comprises

(i) injecting the solution, as a migrant solution, into a second aqueous solution, laminarly flowing in an annular separation chamber as a carrier solution for the migrant solution and stabilised by means of an angular velocity gradient, wherein the migrant solution contains sufficient water-miscible organic liquid of density less than 1 g ml^{-1} at 20° C to reduce its density, relative to the density of the carrier solution, to a level such that injection of the migrant solution into the carrier solution does not give rise to hydrodynamic instability;

(ii) applying a constant electric field across the resulting mixture to produce a differential movement of the components of the migrant solution perpendicular to the direction of flow of the layer; and

(iii) collecting desired separated components.

4,141,810
CATIONIC ELECTRODEPOSITION USING AQUEOUS DISPERSIONS OF QUATERNARY AMMONIUM CARBONATE-CONTAINING POLYMERS

Stephen L. Buchwalter, Allison Park; Joseph F. Bosso, Lower Burrell, and Roger M. Christenson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 744,533. This application Mar. 23, 1978, Ser. No. 889,311
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 C 8 Claims

1. In a method of coating a conductive substrate serving as a cathode which method comprises passing an electric current between an anode and said cathode in electrical contact with a water-dispersed composition of a quaternary ammonium salt group-containing resin, the improvement wherein the quaternary ammonium salt group is a quaternary ammonium carbonate.

4. A method for cathodically electrodepositing a coating on a conductive article which comprises the steps of:

(A) immersing a conductive article in an aqueous dispersion which contains an acidified cationic resinous vehicle, said acid having a dissociation constant of greater than 1×10^{-5},

(B) passing an electric current through the aqueous dispersion between a conductive article as cathode and another electrode as anode to deposit the resinous coating vehicle on the cathode and to generate acid at the anode,

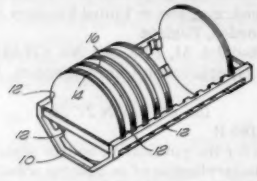
(C) feeding into said aqueous dispersion a polymeric quaternary ammonium carbonate,

(D) reacting said polymeric quaternary ammonium carbonate with said acid to form the corresponding quaternary ammonium salt of said acid.

4,141,811
PLASMA ETCHING PROCESS FOR THE MANUFACTURE OF SOLAR CELLS

John W. Yerkes, Granada Hills, and James E. Avery, Burbank, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 24, 1978, Ser. No. 899,760
Int. Cl.[2] C23C *15/00*; H01L *31/06*
U.S. Cl. 204—192 E 8 Claims



1. The method of manufacturing solar cells comprising:

assembling a plurality of silicon semiconductor wafers of a first conductivity type in spaced apart pairs with adjacent first surfaces of each pair in contact;

diffusing an active impurity of an opposite conductivity imparting type into said wafers to provide a PN junction therein;

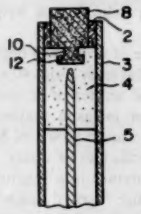
reversing each pair of wafers with the opposite surfaces thereof in contact and with said first surfaces exposed and assembling said thus arranged wafers in spaced apart pairs; and

plasma etching said thus assembled wafers to remove the opposite conductivity portion thereof from said first surfaces and edges thereof.

4,141,812
OXYGEN SENSORS

Takao Kawawa; Ryoichiro Imai; Hisami Tokunaga, all of Fukuyama; Yutaka Nakano, Funabashi, and Naoaki Sasaki, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo and Osaka Oxygen Industries, Ltd., Osaka, both of, Japan

Filed Mar. 2, 1978, Ser. No. 882,633
Claims priority, application Japan, Mar. 2, 1977, 52-23814[U]
Int. Cl.[2] G01N *27/30, 27/58*
U.S. Cl. 204—195 S 8 Claims

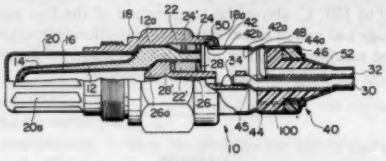


1. In a device for detecting oxygen content of a molten metal having a solid electrolyte galvanic cell mounted in a quartz tube with one end of said galvanic cell projected from one end of said quartz tube, and a powder reference material placed inside said quartz tube and enclosing electrode lead means and said solid electrolyte galvanic cell whereby upon immersion into the molten metal said device generates an electromotive force proportional to a partial pressure of oxygen in said molten metal, the improvement wherein the portion of said solid electrolyte galvanic cell contacting said powder reference material is formed into a shape having at least one circumferential groove to provide an increased contact area between said solid electrolyte galvanic cell and said powder reference material and to increase holding power of said powder reference material.

4,141,813
OXYGEN SENSOR PARTICULARLY USEFUL IN EXHAUST SYSTEM OF AUTOMOTIVE ENGINE

Toru Kita, and Takeshi Fujishiro, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 16, 1977, Ser. No. 769,350
Claims priority, application Japan, Feb. 19, 1976, 51-16560
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S 14 Claims



1. An oxygen sensor comprising:

an oxygen ion-conductive electrolyte tube which is closed at one end;

anode and cathode electrode layers coated on the outer and inner surfaces of said electrolyte tube, respectively;

a shell surrounding said electrolyte tube;

a cap member;

said shell and cap member being arranged so as to permit the flow of gas between the interior of said shell and cap member;

a plug assembly located in said cap member;

said plug assembly being provided with first means for permitting the passage of a gas through said assembly thus

making it possible for gas to pass from outside to inside the cap member by means of said passage and comprising a plug member, said plug member having a cylindrical portion, a ring-shaped retainer member, said retainer member surrounding a part of said cylindrical portion of said plug member, and said plug member having second means for preventing the passage of unpressurized water from outside said cap member to within said cap member by way of said first means; and

cables passing through said plug assembly, said cables being in separate electrical contact with said cathode and anode electrode layers respectively.

4,141,814

DIAPHRAGM CELL

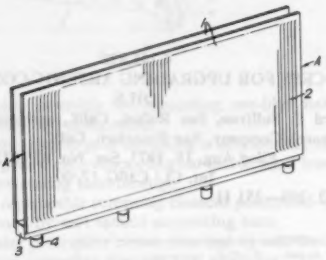
Thomas W. Boulton, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 21, 1977, Ser. No. 817,672

Claims priority, application United Kingdom, Aug. 4, 1976, 32486/76; Aug. 4, 1976, 32488/76; Sep. 9, 1976, 37387/76

Int. Cl.[2] C25B *9/00, 11/02, 11/10, 13/04*

U.S. Cl. 204—252 **10 Claims**



1. An electrolytic cell comprising

a plurality of anodes, each of said anodes comprising two groups of substantially parallel elongated members made of a film-forming metal or alloy thereof carrying on at least part of their surfaces an electrocatalytically active coating, each group of members lying in separate planes and being electrically conductively connected to each other at the bottoms thereof and extending upwardly lengthwise from the area of connection, the planes facing each other and diverging from each other so that the distance therebetween increases gradually from the bottom to the top thereof,

a plurality of upwardly extending cathodes,

a plurality of diaphragms separating the anodes and cathodes, and

the gap between each adjacent anode and cathode gradually decreasing from the bottom of each anode upwardly.

4,141,815

BIPOLAR ELECTRODE

Teruo Ichisaka, and Tadao Ikegami, both of Tamano, Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,862

Claims priority, application Japan, Aug. 24, 1977, 52-100633

Int. Cl.[2] C25B *11/00*

U.S. Cl. 204—290 F **4 Claims**

1. A bipolar electrode comprising

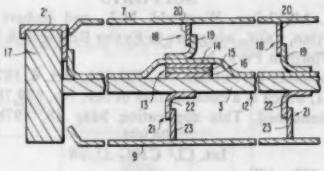
(a) an electrode frame;

(b) a partition wall welded to the electrode frame (a) and comprising a composite structure of an anode-side sheet and a cathode-side sheet;

(c) an anode plate disposed on the anode-side of the partition wall (b);

(d) a cathode plate disposed on the cathode-side of the partition wall (b); and

(e) electrically conductive spacers with both ends welded to the anode plate (c) and the anode-side sheet of the partition wall (b) and to the cathode plate (d) and the cathode-side sheet of the partition wall (b), wherein each of the electrically conductive spacers (e) comprises two elements which are superimposed between the anode plate (c) or the cathode plate (d) and the partition wall (b) and welded at the superimposed surface, so as to form the anode plate (c) and the cathode plate (d) as horizontal uniform planes.



4,141,816

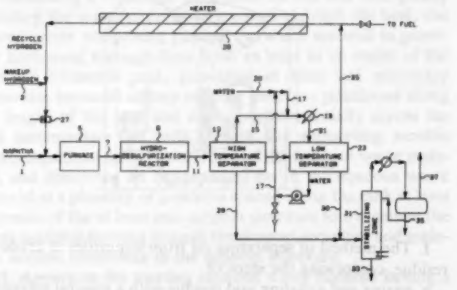
PREVENTING AMMONIUM CHLORIDE DEPOSITION IN HYDROGEN RECYCLE STREAM

Ralph P. Crowley, and Max G. Staples, both of Woods Cross, Utah, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1977, Ser. No. 811,356

Int. Cl.[2] C10G *23/00*

U.S. Cl. 208—107 **6 Claims**



1. A method for preventing deposition of ammonium chloride in a hydrogen recycle stream, said hydrogen stream being recycled from a low temperature separator through a gas compression means and into a hydrogenation reactor, said method comprising supplying indirect heat exchange to said recycle stream upstream of said gas compression means, said heat exchange being sufficient to maintain the temperature of said recycle stream above the deposition temperature for ammonium chloride.

4,141,817

HYDROCARBON CONVERSION PROCESSES UTILIZING A CATALYST COMPRISING A GROUP VIII NOBLE METAL COMPONENT SUPPORTED ON GROUP IIA METAL OXIDE-REFRACTORY METAL OXIDE SUPPORTS

Gary B. McVicker, Westfield, N.J., and Robert L. Garten, Cupertino, Calif., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 729,834, Oct. 4, 1976, Pat. No. 4,094,821, which is a continuation of Ser. No. 579,789, May 22, 1975, abandoned. This application May 18, 1978, Ser. No. 906,994

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 8 Claims

1. A reforming process which comprises contacting a naphtha feedstream with a catalyst at reforming conditions and recovering a higher octane product which catalyst comprises a Group VIII metal or mixtures thereof supported on a Group IIA metal oxide selected from the group consisting of calcium oxide, barium oxide, strontium oxide and mixtures thereof which Group IIA metal oxide is supported on an acidic refractory oxide wherein the Group IIA metal oxide is present in sufficient quantity to neutralize the sites of the acidic refractory oxide support and to supply an excess at a level of from about 0.5 to 50 moles Group IIA metal oxide per mole of said Group VIII metal or mixtures thereof, the Group VIII metal or mixtures thereof on Group IIA metal oxide or mixtures thereof on neutralized acidic refractory oxide combination being admixed with an acidic refractory oxide.

4,141,818

METHOD OF COLLECTING OIL FROM CRUDE OIL RESIDUE

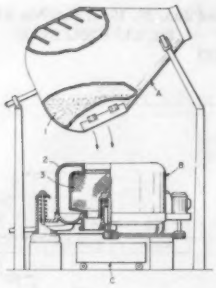
Jung B. An, #3-1 JungAng Dong, Busan, Rep. of Korea (600)

Filed Sep. 26, 1977, Ser. No. 836,496

Claims priority, application Rep. of Korea, Jun. 23, 1977, 1475

Int. Cl.[2] C10G *21/14*

U.S. Cl. 208—177 6 Claims



1. The method of separating oil from impurities in crude oil residue, comprising the steps of

a. mixing and agitating said residue with a mineral solvent to an extent sufficient to crush said residue and soak said crushed residue with said solvent, and,

b. centrifugally separating solvent and dissolved crude oil from said residue by rapidly rotating said crushed and soaked residue in a separator having a fine mesh wall, said separator being within a heated, spaced cylindrical body,

c. said solvent and dissolved oil passing through said mesh wall upon rotation of said wall and collecting in said heated, spaced body, said residue impurities being retained within said mesh wall and removed separately therefrom.

4,141,819

PROCESS FOR TREATING A SOUR PETROLEUM DISTILLATE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 760,295, Jan. 18, 1977, Pat. No. 4,087,378. This application Jan. 10, 1978, Ser. No. 868,367

Int. Cl.[2] C10G *27/06*

U.S. Cl. 208—206 11 Claims

1. A process for treating a mercaptan-containing sour petroleum distillate which comprises contacting said distillate with a supported metal phthalocyanine catalyst in the presence of an alkaline reagent at oxidation conditions, said catalyst having been prepared by impregnating a solid adsorptive support with a common alcoholic solution of a metal phthalocyanine and a carboxylic acid containing up to about 10 carbon atoms in a weight ratio of acid to phthalocyanine of from about 1.5:1 to about 15:1, and thereafter drying the resulting catalytic composite.

4,141,820

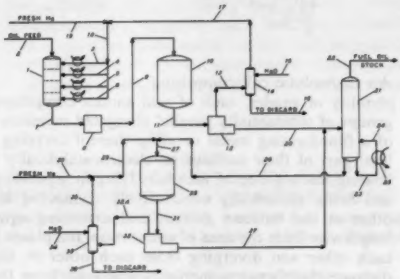
PROCESS FOR UPGRADING ARSENIC-CONTAINING OILS

Richard F. Sullivan, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 18, 1977, Ser. No. 825,872

Int. Cl.[2] C10G *17/00*

U.S. Cl. 208—251 H 6 Claims



1. In a process for substantially removing arsenic and nitrogen contaminants from a feedstock of hydrocarbon oil containing said contaminants to prevent arsenic contaminant fouling of feed-transfer lines carrying said hyrocarbon oil mixed with hydrogen, the improvement which comprises: contacting under arsenic-removing conditions, including a temperature in the range of from about 200° C. to 500° C., a mixture of said hydrocarbon oil and hydrogen with a porous contact material comprising at least one solid refractory oxide selected from the group consisting of the oxides of the elements of Groups II, III, and IV of the Periodic Table, said mixture being formed in situ in the presence of said contact material, whereby the resulting oil contains substantially less arsenic than said feedstock; hydrodenitrifying said resulting oil under hydrodenitrifying conditions using a silica-alumina composite hydrocarbon hydrodenitrifying catalyst containing titania, nickel and tungsten, to provide a partially denitrified oil having a bound nitrogen content, calculated as nitrogen, in the range from about 30 to 700 parts per million parts by weight of said resulting oil; separating said partially denitrified oil into a fraction boiling above about 329° C. and a fraction boiling below about 329° C.; and hydrodenitrifying at least a portion of said fraction boiling above about 329° C. under hydrocarbon denitrifying conditions.

4,141,821
SCREENING DECK ASSEMBLY

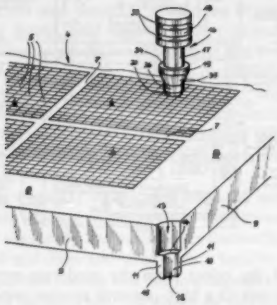
Kurt Wolff, Dinslaken, Fed. Rep. of Germany, assignor to Firma Steinhaus GmbH, Mulheim (Ruhr), Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,376

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622709; Jul. 20, 1976, 2632511

Int. Cl.[2] B07B 1/46

U.S. Cl. 209—405 **23 Claims**



1. A screening assembly for separating ore-like materials according to size, and comprising:

a polygonally shaped grid including a plurality of spaced supporting bars, each supporting bar including at least one aperture extending therethrough;

at least one replaceable screening element positioned within a gap formed by said spaced supporting bars;

hollow tubular protrusion means attached to said screening element and extending through said aperture;

said protrusion means having an external diameter less than the internal diameter of the surrounding aperture wall; and

separate securing means extending through said protrusion means for wedging said protrusion means into releasable contact with said aperture wall, to provide a continuous screening surface covering said grid member;

said securing means having an end surface extending substantially within the plane of a top surface of said screening element when said securing means is completely inserted into said protrusion means.

4,141,822
PHOSPHATE STRIPPING OF SEWAGE

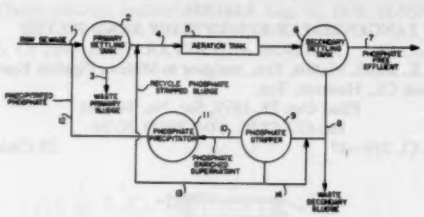
Gilbert V. Levin, Chevy Chase, Md.; Alexandra G. Tarnay, Fairfax, Va.; George J. Topol, deceased, late of Montgomery County, Md., and by Citizens Bank and Trust Company, legal representative, Riverdale, Md., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 581,951, Jun. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 481,793, Jun. 21, 1974, abandoned. This application Jun. 30, 1977, Ser. No. 811,595

Int. Cl.[2] C02C 1/17

U.S. Cl. 210—6 **17 Claims**

1. An activated sludge sewage treatment process which comprises aerating a mixed liquor comprising phosphate-containing influent sewage material and activated sludge in an aeration zone to reduce the BOD content of said sewage material and to cause the microorganisms present to take up phosphate; separating a phosphate-enriched sludge, in which the phosphate is present in the sludge solids, from the mixed liquor to provide a substantially phosphate-free effluent; passing said phosphate enriched sludge to a phosphate stripping zone and settling said phosphate-enriched sludge to form supernatant liquor in said stripping zone upper section, and settled sludge; maintaining at least part of said settled sludge under anaerobic conditions for a time sufficient to release phosphate from the sludge solids to the liquid phase of said settled sludge; contacting the anaerobic sludge containing released phosphate in the liquid phase thereof with a lower soluble phosphate content aqueous medium to transfer the soluble phosphate in the anaerobic sludge liquid phase to said lower soluble phosphate content aqueous medium, for phosphate enrichment of supernatant liquor in said stripping zone upper section; and recycling at least a portion of said anaerobic sludge from said phosphate stripping zone to said aeration zone as said activated sludge.



4,141,823
TREATMENT OF WASTE WATER

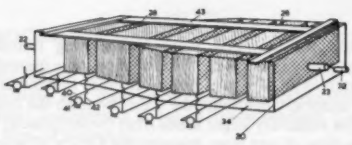
Kenneth C. Smith, Royden, and Michael E. Garrett, Woking, both of England, assignors to The British Oxygen Company Limited, London, England

Filed Aug. 3, 1976, Ser. No. 711,354

Claims priority, application United Kingdom, Aug. 5, 1975, 32637/75

Int. Cl.[2] C02C 1/04

U.S. Cl. 210—17 **23 Claims**



1. In a process for treating aqueous waste material having a biochemical oxygen demand, which process comprises passing the aqueous waste material along an elongate treatment tank for containing a volume of such material and and biologically digesting the waste material as it passes through the tank, the improvement comprising passing the waste material in generally horizontal through-flow from an inlet to an outlet of the elongate treatment tank, providing at least one stationary transverse bacterial colony support structure positioned along the length of the tank and extending substantially across the tank intermediate the ends thereof and supporting aerobic micro-organisms below the surface of the aqueous waste material, and dissolving an oxygenating gas in the aqueous waste material at a plurality of positions spaced along the tank at least upstream of the at least one support structure to oxygenate the waste material flowing toward the support structure and maintain aerobic conditions in the support structure.

11. Apparatus for treating aqueous waste material having a biochemical oxygen demand, which apparatus comprises an elongate treatment tank for containing a volume of aqueous waste material to be treated and having an inlet, and an outlet spaced along the tank from the inlet for providing for the generally horizontal flow of liquid therethrough, a generally transverse support structure extending substantially across the tank positioned within the tank generally beneath the surface of aqueous waste material to be treated for supporting aerobic micro-organisms, said support structure being positioned along the length of the interior of the tank intermediate the inlet and outlet to receive horizontal through-flow of aqueous waste,

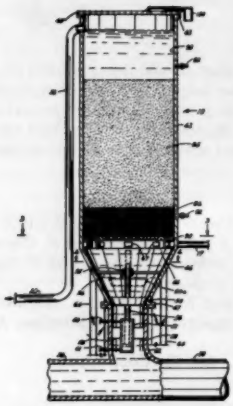
and means for introducing oxygenating gas into the interior of the tank upstream of the support structure whereby the aqueous waste material is oxygenated and aerobic conditions maintained in the support structure.

4,141,824

TANGENTIALLY FED UPFLOW SAND FILTER METHOD AND APPARATUS

Carl K. Smith, Mathis, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Oct. 25, 1977, Ser. No. 845,341
Int. Cl.[2] C02C *1/04;* B01D *29/36*
U.S. Cl. 210—17 **25 Claims**



1. Method for purifying water, comprising introducing water tangentially into a water introduction zone immediately beneath the bottom of a sand bed of circular horizontal cross section to uniformly distribute the water beneath the sand bed and to throw relatively larger solids from the introduced water toward the sides of said zone, maintaining a body of water in a space beneath said zone which is maintained in swirling motion by the introduced water and through which said relatively larger solids settle while being continuously thrown outwardly by said swirling motion, passing water upwardly from said zone through said sand bed at a uniform upward speed of about six inches per minute, passing the water exiting from the top of the sand bed upwardly through a settling chamber above the sand bed to remove any suspended sand particles therefrom, and withdrawing purified water from the upper portion of said settling chamber.

4,141,825

DESALINATION PROCESS SYSTEM AND BY-PRODUCT RECOVERY

Franklin E. Conger, Summit, N.J., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Oct. 31, 1977, Ser. No. 846,779
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 H **4 Claims**

1. A process for the purification and desalination of water containing from 500 ppm to 36,000 ppm salt comprising the steps of:

(a) selecting the water containing 500 ppm to 3,000 ppm salt;

(b) delivering the water containing 500 ppm to 3,000 ppm salt to an electrodialysis unit;

(c) producing product water containing less than 500 ppm and reject in the electrodialysis unit;

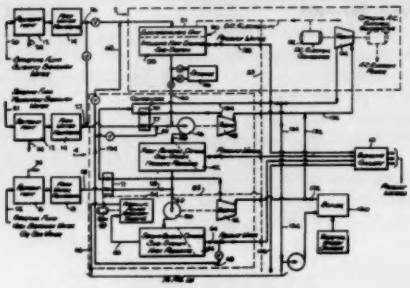
(d) selecting the water containing 3,000 ppm to 7,500 ppm salt;

(e) delivering the water containing 3,000 ppm to 7,500 ppm salt and the reject from the electrodialysis unit to a moderate pressure reverse osmosis unit;

(f) producing product water containing less than 500 ppm and reject in the moderate pressure reverse osmosis unit;

(g) selecting the water containing 7,500 ppm to 36,000 ppm salt;

(h) delivering the water containing 7,500 ppm to 36,000 ppm



salt and the reject from the moderate pressure reverse osmosis unit to a high-pressure reverse osmosis unit;

(i) producing product water containing 300 ppm to 800 ppm and reject in the high-pressure reverse osmosis unit; and

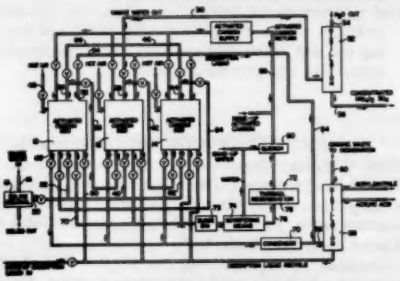
(j) blending the product water from the electrodialysis unit, product water from the moderate-pressure reverse osmosis unit and product water from the high-pressure reverse osmosis unit.

4,141,826

TREATMENT OF ACRYLONITRILE WASTE WATER WITH ACTIVATED CARBON

Harvey E. Alford, Amherst, and Kenneth L. Bigler, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 30, 1977, Ser. No. 782,801
Int. Cl.[2] C02C *5/02*
U.S. Cl. 210—26 **9 Claims**



1. A process for treating acrylonitrile waste water to facilitate disposal thereof and recover acrylonitrile and acrylic acid therefrom, said process comprising

(1) adsorbing organics contained in said acrylonitrile waste water by passing said acrylonitrile waste water through first and second activated carbon beds arranged in series whereby the acrylonitrile waste water passing out of said second activated carbon bed has a reduced organics content,

(2) thereafter liquid-regenerating said first activated carbon bed by passing a regenerating liquid having a boiling point higher than the organics in said acrylonitrile waste water through said first activated carbon bed to desorb the organics contained therein and thereby produce an organics-rich regenerating liquid, said organics-rich regenerating liquid being distilled to produce acrylonitrile and

acrylic acid as distillate and regenerating liquid as distillation bottoms,

(3) simultaneously with step (2), adsorbing organics from additional amounts of acrylonitrile waste water by passing additional amounts of acrylonitrile waste water in series through said second activated carbon bed and then through a third activated carbon bed,

(4) thereafter, liquid-regenerating said second activated carbon bed by passing regenerating liquid through said second activated carbon bed to desorb the organics contained therein and thereby produce an organics-rich regenerating liquid, said organics-rich regenerating liquid being distilled to produce acrylonitrile and acrylic acid as distillate and regenerating liquid as distillation bottoms,

(5) simultaneously with step (4) adsorbing organics from additional amounts of acrylonitrile waste water by passing acrylonitrile waste water in series through said third activated carbon bed and then through said first activated carbon bed,

(6) repeating steps (1) to (5) until each of said activated carbon beds is liquid regenerated at least three times, and thereafter separately and in sequence thermally regenerating each of said three activated carbon beds by passing the activated carbon therein to a thermal regeneration furnace and heating the activated carbon to an elevated temperature sufficient to burn off the organics thereon.

4,141,827

PROCESS FOR CLARIFYING COAL WASH WATERS

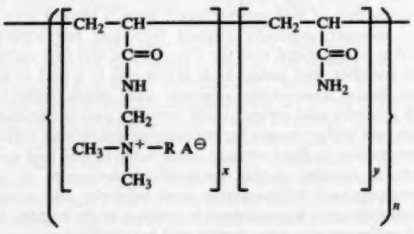
Anthony T. Coscia, South Norwalk, and Michael N. D. O'Connor, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 735,577, Oct. 26, 1976, abandoned. This application May 2, 1977, Ser. No. 792,745

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—54 **5 Claims**

1. A process for settling suspended solids in coal washing waste water which comprises mixing with said water an effective amount of a water soluble polymer consisting essentially of repeating units of the structure



wherein $A^{\ominus}$ is an anion, R is alkyl of 1–3 carbons or hydroxyalkyl of 2–3 carbons, x is a mol fraction of at least about 50 percent, y is a mol fraction of up to about 50 percent and represents unmodified acrylamide units, and n is an integer in the range of 100 to about 1,600 to provide the chemically-modified polyacrylamide with an intrinsic viscosity in the range of about 0.1 to 0.45 deciliters per gram when measured in 3M NaCl at 30° C. and thereafter settling the solids to provide a clarified supernatant liquid.

4,141,828

PROCESS FOR TREATING WASTE WATER

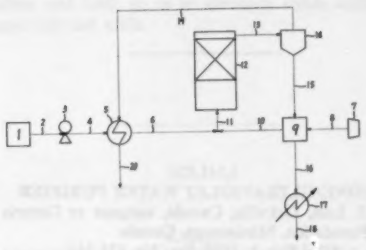
Nobuhiko Okada; Yoichi Nakanishi, and Yoshiaki Harada, all of Osaka, Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,496

Claims priority, application Japan, Aug. 10, 1976, 51-95507

Int. Cl.[2] C02B *1/34*; C02C *5/04*

U.S. Cl. 210—63 R **13 Claims**



1. A process for treating ammonia-containing waste water which comprises subjecting at a pH of at least 9 the ammonia-containing waste water to wet oxidation with an oxygen-containing gas in the presence of a catalyst while maintaining the waste water at a temperature of 100 to 370° C. and at pressure permitting the waste water to remain in the liquid phase, the catalyst being supported by a carrier and comprising at least one of iron, cobalt, nickel, ruthenium, rhodium, palladium, iridium, platinum, copper, gold, tungsten and water-insoluble compounds thereof.

4,141,829

PROCESS FOR WET OXIDATION OF ORGANIC SUBSTANCES

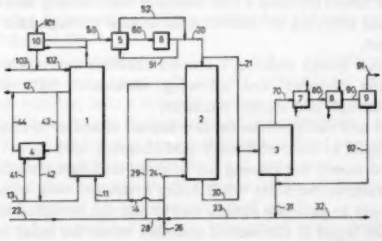
Reinhard Thiel; Karl-Heinz Dietz; Hans Kerres; Heinz J. Rosenbaum, and Siegfried Steiner, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,295

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640603

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—63 R **13 Claims**



1. Process for the oxidation of organic substances, dissolved or dispersed in an aqueous system, with a gas containing molecular oxygen at elevated temperature and under elevated pressure chiefly to carbon dioxide and water, with subsequent phase separation of the reaction mixture into a gaseous phase substantially containing inert gas, carbon dioxide, steam and organic constituents and a liquid phase substantially containing water, characterized in that the pressure is adjusted, at the given temperature, so that the ratio of the total pressure (P_t) to the partial pressure of the steam in the reaction solution (P_w) is between 1.05 to 1.5 and so that by evaporation of water from

the aqueous system, more steam than the exothermicity of the oxidation reaction gives rise to, goes into the aqueous phase, which is fed to a heat exchanger in which the amount of heat required to maintain the oxidation temperature is completely or partially transferred to a mixture of water and a gas containing molecular oxygen, which mixture flows in on the other side of the heat exchanger and is subsequently fed to the reactor.

4,141,830

OZONE/ULTRAVIOLET WATER PURIFIER

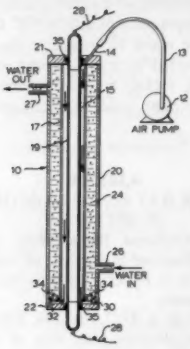
Anthony J. Last, Oakville, Canada, assignor to Ontario Research Foundation, Mississauga, Canada

Filed Feb. 1, 1978, Ser. No. 874,144

Claims priority, application United Kingdom, Feb. 2, 1977, 4331/77

Int. Cl.[2] C02B *1/38, 3/00*

U.S. Cl. 210—63 Z **11 Claims**



1. Apparatus for treating a liquid, comprising:

an ultraviolet light source,

first means defining a first chamber surrounding said source and allowing ultraviolet light to pass through said chamber,

second means defining a second chamber surrounding said first chamber and allowing ultraviolet light to pass through said second chamber,

inlet and outlet means on said second chamber to allow said liquid to enter and leave said chamber, and

third means for causing air to enter said first chamber and traverse the same while being irradiated with ultraviolet light to generate ozone, and to mix the ozonated air with the liquid in the second chamber while the latter is being irradiated with ultraviolet light.

8. A method of purifying a liquid, comprising the steps:

passing air through a first chamber surrounding a source of ultraviolet light, to allow said light to convert some of the oxygen in the air to ozone,

passing said liquid through a second chamber surrounding said first chamber, the second chamber also being irradiated by said source simultaneously with said first chamber, and

passing the air from said first chamber into the liquid in the second chamber to allow mixing of the air with the liquid in the second chamber.

4,141,831

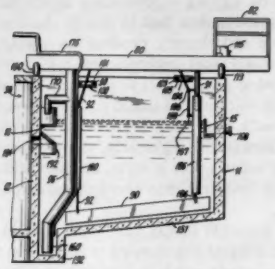
APPARATUS FOR REMOVAL OF SOLIDS FROM A SEDIMENTATION ZONE

Barry A. Minbiole, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,986

Int. Cl.[2] C02C *1/08*

U.S. Cl. 210—195 S **9 Claims**



1. In a system for separation of a liquid-solid mixture by sedimentation in a sedimentation zone formed by spaced-apart, substantially parallelly aligned side walls and end walls joined to and disposed substantially at right angles with respect to said side walls to provide an enclosed sedimentation volume; means for introducing and distributing feed liquid-solid in said sedimentation zone for sedimentation therein to form a solids-depleted liquid in the upper part of said zone and a layer of settled solids in the bottom part thereof; means for discharging solids-depleted liquid from said upper part of said sedimentation zone; a solids collection trough extending along the bottom of said sedimentation zone; a bridge extending transversely across and above said sedimentation zone; mechanical drive means for moving said bridge in a longitudinal path reciprocatingly and repetitively along said sedimentation zone between said end walls; a scraper blade attached to said bridge, extending transversely across said sedimentation zone at the bottom thereof and having one end adjacent said solids collection trough whereby said solids settled in the bottom part of said sedimentation zone are collected and transferred by said blade to said solids collection trough during the travel of said blade along said sedimentation zone in both directions of movement; and means for withdrawal of collected solids from said solids collection trough; the improvement comprising: a first vertical tubular member, joined at its upper end to a part of said bridge transversely opposite said solids collection trough, and terminating at its lower end at a point intermediate said bridge and the bottom part of said sedimentation zone; a second vertical tubular member, coaxially aligned with and telescopingly coupled at its upper end with the lower end of said first vertical tubular member, and joined at its lower end to a part of said scraper blade transversely opposite said solids collection trough whereby said scraper blade opposite part is suspended beneath said bridge; means for maintaining the second vertical tubular member in fixed vertical relationship to said first vertical tubular member during longitudinal movement of said bridge along said sedimentation zone whereby said scraper blade opposite part is maintained in position at the bottom part of said sedimentation zone during said longitudinal movement of said bridge; flexible suspension means joining a part of said bridge adjacent said solids collection trough and a part of said scraper blade adjacent said solids collection trough, for drawing said scraper blade adjacent part in a longitudinal path along said sedimentation zone during said longitudinal movement of said bridge in trailing relationship to the point of attachment of said flexible suspension means to said bridge such that said scraper blade is disposed at an acute angle with respect to said transversely extending bridge during said longitudinal movement thereof; means for shortening the suspended length of

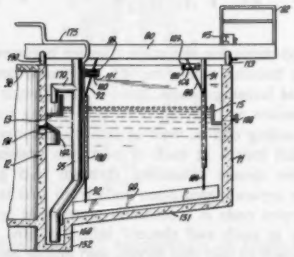
said flexible suspension means and means for vertically upwardly translating said second vertical tubular member relative to said first vertical tubular member at the approach of said bridge to each said end wall of said sedimentation zone, whereby said scraper blade is drawn toward the end wall for transverse alignment therewith, and for increasing the suspended length of said flexible suspension means and for vertically downwardly translating said second vertical tubular member relative to said first vertical tubular member after said transverse alignment upon reciprocal movement of said bridge toward the other end wall, so as to eliminate solids accumulation adjacent said end walls.

4,141,832

APPARATUS FOR REMOVAL OF SOLIDS FROM A SEDIMENTATION ZONE

Barry A. Minbiole, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,298
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—195 S **10 Claims**



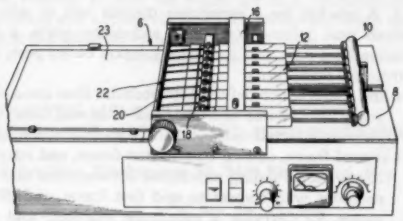
1. In a system for separation of a liquid-solid mixture by sedimentation in a sedimentation zone formed by spaced-apart, substantially parallelly aligned side walls and end walls joined to and disposed substantially at right angles with respect to said side walls to provide an enclosed sedimentation volume; means for introducing and distributing feed liquid-solid in said sedimentation zone for sedimentation therein to form a solids-depleted liquid in the upper part of said zone and a layer of settled solids in the bottom part thereof; means for discharging solids-depleted liquid from said upper part of said sedimentation zone; a solids collection trough extending along the bottom of said sedimentation zone; a bridge extending transversely across and above said sedimentation zone; mechanical drive means for moving said bridge in a longitudinal path reciprocatingly and repetitively along said sedimentation zone between said end walls; a scraper blade attached to said bridge, extending transversely across said sedimentation zone at the bottom thereof and having one end adjacent said solids collection trough whereby said solids settled in the bottom part of said sedimentation zone are collected and transferred by said blade to said solids collection trough during the travel of said blade along said sedimentation zone in both directions of movement; and means for withdrawal of collected solids from said solids collection trough; the improvement comprising: a first cable member joining a part of said bridge adjacent said solids collection trough and a part of said scraper blade adjacent said solids collection trough, for drawing said scraper blade adjacent part in a longitudinal path along said sedimentation zone during said longitudinal movement of said bridge in trailing relationship to the point of attachment of said first cable member to said bridge such that said scraper blade is disposed at an acute angle with respect to said transversely extending bridge during said longitudinal movement thereof; a vertical tubular member, joined at its upper end to a part of said bridge transversely opposite said solids collection trough, and terminating at its lower end at a point intermediate said bridge and the bottom part of said sedimentation zone; a second cable member coupling the lower end of said vertical tubular member with a part of said scraper blade transversely opposite said solids collection trough whereby said scraper blade opposite part is suspended beneath said bridge; and means for shortening the suspended lengths of said first and second cable members at the approach of said bridge to each said end wall, whereby said scraper blade is drawn toward said end wall for transverse alignment therewith, and for increasing the suspended lengths of said first and second cable members after said transverse alignment upon reciprocal movement of said bridge toward the other end wall, so as to eliminate solids accumulation adjacent said end walls.

4,141,833

ANCHORING MEANS FOR TLC SYRINGE AND APPARATUS

Judith G. Cummins, Libertyville, Ill., assignor to Analytical Instrument Specialties, Inc., Libertyville, Ill.

Filed Apr. 21, 1977, Ser. No. 789,648
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **7 Claims**



1. An anchoring rack cradle and syringe assembly for use in conjunction with TLC apparatus comprising in combination,

a syringe having a plunger, a cylindrical syringe body, volume gradations on said body, and a forward end for discharging TLC samples into a mounted needle,

an anchoring button member fixed to a mounting area comprising a forward end of the syringe and the rearward end of the needle,

said anchoring button member having a cylindrical stub defining a cylindrical path situated to be closely received and retained into a selected mounting area and a flange plate towards the forward end of the cylindrical stub,

said flange plate being engageable with a fixed complimentary anchoring means on the TLC apparatus,

said complimentary anchoring means on the TLC apparatus being formed by an anchoring rack cradle,

said rack cradle including an elongated body positioned below said anchoring button member on said syringe,

a plurality of transverse slots in said rack cradle to receive said flange plates of said syringe,

each of said transverse slots in said rack cradle being aligned with said flange plate of said corresponding syringe,

and inclined walls extending from the top of said rack cradle to each side of said transverse slot thereof to facilitate the positioning of said flange plate therein,

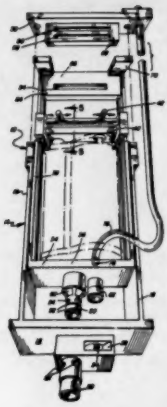
whereby each of a gang of syringes may be aligned and positioned on the TLC apparatus thereby to prevent axial as well as radial movement of the syringes when positioned therein.

4,141,834

APPARATUS FOR MEASURING ULTRAFILTRATION DURING DIALYSIS

Marc Bellotti, Winnetka, and William J. Schnell, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 15, 1977, Ser. No. 851,663
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—241 3 Claims



1. A bracket for a membrane dialysis unit in which said dialysis unit defines blood inlet and outlet ports, a dialysis solution inlet port, and a dialysis solution outlet port, the improvement comprising:

a first frame which defines a first tubular flow conduit defining a first lateral aperture, and a second flow conduit defining a closed outer end and a second lateral aperture;

a second frame, carried by said first frame, and adapted for relative axial sliding movement between first and second positions with respect to said first frame, and including means for carrying a membrane dialyzer, said second frame defining a third tubular flow conduit positioned in telescoping relation with said first flow conduit and defining third lateral aperture means, and a wall obstructing the bore of said third tubular conduit positioned inwardly of the third aperture means, and a fourth tubular flow conduit positioned in telescoping relation with said second flow conduit, said third and fourth flow conduits being respectively adapted to communicate with a dialysis unit inlet and outlet; said apertures being positioned whereby, in the first sliding position, the first lateral aperture is sealed by said third flow conduit, and the third aperture means is positioned to permit fluid communication through said third conduit and through said third aperture means, around said bore-obstructing wall, in a flow path adapted to lead through dialysis solution inlet port mounted therein, and said fourth conduit is spaced to permit fluid flow from said dialysis solution outlet port through said fourth conduit and said second lateral aperture;

and whereby in the second sliding position said third lateral aperture means provides fluid communication with said first lateral aperture means and is otherwise sealed to prevent fluid flow in the flow path adapted to lead through said mounted dialyzer, said fourth flow conduit being positioned to prevent flow therethrough and through said second conduit,

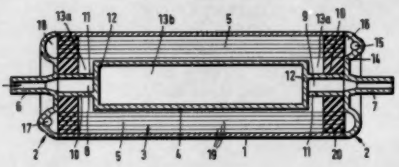
and conduit means communicating with the sealable portion of the dialysis solution flow path, said conduit means extending vertically upwardly to a vertical level at least adjacent the top of the dialyzer, and being adapted for communication with liquid volume measuring means.

4,141,835

APPARATUS FOR THE MASS TRANSFER BETWEEN TWO MEDIA

Wilfried Schael; Jan-Erik Sigdell, both of Bad Homburg, and Gerd E. Krick, Usingen, all of Fed. Rep. of Germany, assignors to Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG., Bad Homburg, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,758
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646358
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 A 12 Claims



1. An apparatus for the mass transfer between two media comprising housing means having two ends, core means located in said housing means, hollow fiber means surrounding said core means and having open ends facing toward the respective housing end as well as interstices between adjacent fibers, gasket means at each of said two housing ends, said hollow fiber means extending through said gasket means which thus separate said open ends from said interstices and hold said open ends in a common plane, said housing means comprising at each end thereof inflow means and outflow means for each of said two media, said inflow means comprising first ring chamber means located at one end of said housing means and communicating with said open ends of said hollow fibers, said outflow means comprising second ring chamber means located at the other end of said housing means, said inflow means and said outflow means further comprising respective connecting pipe section means, and wherein at least one of said first and second ring chamber means for that medium which flows through said hollow fiber means from one end to the other, comprises a hollow space facing said common plane of open fiber ends, said hollow space having a weight above said common plane which is largest in the area where the respective flow means merge into the corresponding hollow space and which height diminishes in a direction away from the respective flow means merging area, whereby said hollow space has a configuration which uniformly distributes the respective flowing medium over said common plane in which said open fiber ends are located, said hollow space configuration being located between the respective connecting pipe section and said open ends of said hollow fiber means.

4,141,836

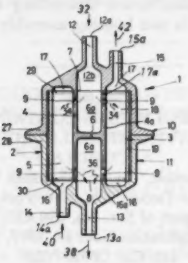
DIALYSER CARTRIDGE AND METHOD FOR ITS MANUFACTURE

Wilfried Schael, Bad Homburg, Fed. Rep. of Germany, assignor to Chemisch-pharmazeutische Industrie KG. Apparatebau Dr. Eduard Fresenius, Bad Homburg von der Hohe, Fed. Rep. of Germany

Filed Sep. 20, 1976, Ser. No. 724,935
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1975, 2542438
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 A 7 Claims

1. A dialyser comprising housing means having a longitudinal axis and a central plane of symmetry extending perpendicularly to said longitudinal axis, said housing means including first and second housing members each of which has a substantially mirror-symmetrical shape relative to the respective other

housing member and relative to said plane of symmetry, each housing member having an open end portion facing said plane of symmetry and means for connecting the open end portions of the two housing members to each other, each housing member further comprising a port section opposite said open end portion, each port section comprising first central port means arranged substantially concentrically relative to said longitudinal axis and a central cavity smoothly merging into said central port means and open opposite the respective first port means, each port section further comprising second port means located radially outwardly of said first, central port means and a ring cavity surrounding said central cavity and smoothly merging into the respective second port means, said ring cavity also being open toward said open end portion of the respective housing member, dialyser cartridge means in said housing means, said dialyser cartridge means comprising hollow tubular core means with a wall therein dividing said hollow tubular core means into two cavities extending coaxially relative to



said longitudinal axis and substantially in register with the respective one of said central cavities in the corresponding port section, hollow filaments wound on said hollow, tubular core means, said hollow filaments having open ends, means bonding said open ends of said filaments to each other so as to close the spaces between the filaments adjacent the open ends and to form a ring body of filaments directly around said hollow tubular core means, said ring body of filaments having interstices between adjacent filaments intermediate said bonding means, radially extending holes in said hollow, tubular core means to provide for a smooth flow communication between said first port means through said central cavities, through said radially extending holes, and through said interstices between adjacent filaments, said open ends of said filament ring body extending substantially in register with the respective one of said ring cavities to provide for a further smooth flow communication between said second port means through said ring cavities and longitudinally through said hollow filaments.

4,141,837

OSCILLATING CENTRIFUGE FOR THE DEHYDRATION OF FINE GRAINED MATERIAL

Wolfgang Heckmann, and Wilhelm Reulecke, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Klöckner-Humboldt Deutz AG, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 845,927

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651099

Int. Cl.² B01D *21/26*

U.S. Cl. 210—365 **9 Claims**

1. A vertically oscillatible centrifuge for the dewatering of a fine grained material comprising in combination:

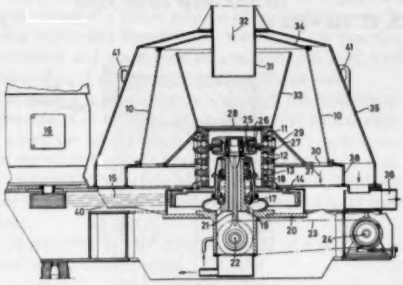
a vertical downwardly flaring frusto conically shaped sieve cage rotatable about its vertical axis and being axially oscillatible having a sieve portion with the diameter of the sieve portion increasing in a downward direction;

an oscillatory vertical drive;

first and second elastically yieldable connections between said drives and said sieve case so that the cage is simultaneously rotatable and vertically oscillatible;

a stationary housing surrounding said sieve cage for the collection of water passing through the sieve cage and forming a housing for the cage;

means for delivering a material to the interior of the sieve cage to be centrifuged;



and an annular downwardly extending stationary solids collection housing located at the lower end of the sieve cage and having an inner diameter at least as large as the maximum diameter of said sieve cage so that material passes downwardly along the inner wall of the sieve cage and is centrifuged over the lower edge to the solids collection housing so that the solids are at a relatively low elevation and a relatively small circumference when they reach the solids collection housing.

4,141,838

DIALYSIS MEMBRANE, ESPECIALLY FOR HEMODIALYSIS, AND METHOD FOR PRODUCING SAME

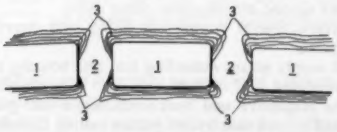
Berthold Schilling, Kirchstrasse 15, 5439 Elsoff, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 754,998

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559332

Int. Cl.² B01D *39/10, 39/20;* C25D *5/00;* B05D *1/40*

U.S. Cl. 210—498 **9 Claims**



1. A structure for use with hemodialysis apparatus and the like comprising:

reusable membrane means for effecting a purification of body fluids by diffusion, osmosis and ultrafiltration including;

a foil-plate,

said foil-plate having a plurality of passages therethrough,

said passages being holes of substantially uniform diameter and of substantially uniform distance from one another,

said holes being approximately perpendicular to the plane of the foil-plate,

coating means provided on said foil-plate to accurately define the effective diameters of said holes, and

each of the original holes being of approximately 50,000 A in diameter with said coating means reducing the original diameter of each hole by using electrolysis to reduce said diameter to approximately 10,000 A and then further reducing said diameter to the range of 20 to 80 A for each hole by using vaporization.

4,141,839
MULTIHYDROCYCLONE

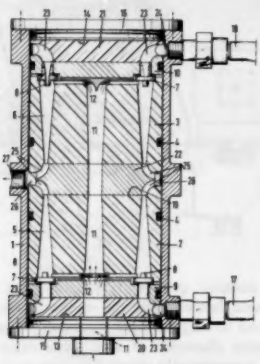
Klaas B. Niemeijer, Veendam, Netherlands, assignor to Koninklijke Scholten-Honig N.V., Amsterdam, Netherlands

Continuation of Ser. No. 542,907, Jan. 22, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,119

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1974, 2408767

Int. Cl.[2] **B01D** *21/26, 33/02*

U.S. Cl. 210—512 M **3 Claims**



1. A multihydrocyclone system comprising:

a housing assembly having opposite ends;

first and second multihydrocyclone units positioned within said housing assembly, each said multihydrocyclone unit having therein a plurality of parallel hydrocyclones, each said hydrocyclone of each said multihydrocyclone unit having a feed inlet opening adjacent a first end thereof, an overflow outlet extending from said first end thereof, and a drain outlet at a second end thereof, the drain outlets of the hydrocyclones of said first multihydrocyclone unit facing the drain outlets of the hydrocyclones of said second multihydrocyclone unit;

a drain header space defined within said housing assembly between said first and second multihydrocyclone units;

a drain insert completely filling said drain header space;

means for covering said opposite ends of said housing assembly and for defining therein respective overflow header spaces with respective overflow outlet ends of said first and second multihydrocyclone units;

overflow inserts completely filling said overflow header spaces;

inlet supply means extending into said housing assembly for supplying feed through said feed inlet openings and into the respective said hydrocyclones, a first portion of the feed in each said hydrocyclone exiting therefrom through said overflow outlet thereof, and a second portion of the feed in each said hydrocyclone exiting therefrom through said drain outlet thereof;

overflow outlet discharge means leading from said housing assembly for removing said first feed portions;

first conduit means, extending from said overflow outlets to said overflow outlet discharge means, for passing said first feed portions from said overflow outlets to said overflow outlet discharge means at substantially uniform and unreduced rates of flow, said first conduit means comprising first discharge conduits one each extending throughout the entire length thereof from a respective of said overflow outlets through a respective said overflow insert, and first collecting conduit means extending from said first discharge conduits to said overflow outlet discharge means, said first collecting conduit means having throughflow areas dimensioned to substantially avoid any reduction in average flow velocity of said first feed portions from said first discharge conduits to said overflow outlet discharge means, said first collecting conduit means comprising annular recesses jointly formed in said housing assembly and in respective of said overflow inserts;

drain outlet discharge means leading from said housing assembly for removing said second feed portions; and

second conduit means, extending from said drain outlets to said drain outlet discharge means, for passing said second feed portions from said drain outlets of both said first and second multihydrocyclone units to said drain outlet discharge means at substantially uniform and unreduced rates of flow, said second conduit means comprising second discharge conduits one each extending throughout the entire length thereof from a respective of said drain outlets through said drain insert, and a second collecting conduit means extending from said second discharge conduits to said outlet discharge means, said second collecting conduit means having throughflow areas dimensioned to substantially avoid any reduction in average flow velocity of said second feed portions from said second discharge conduits to said drain outlet discharge means, said second collecting conduit means comprising an annular recess jointly formed in said housing assembly and in said drain insert.

4,141,840
DRILLING FLUIDS CONTAINING POLYETHOXYLATED, SULFURIZED FATTY ALCOHOLS

Thad O. Walker, Humble, Tex., and Kenneth W. Warren, Tulsa, Okla., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 698,435, Jun. 21, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,390

Int. Cl.[2] **C09K** *7/02*

U.S. Cl. 252—8.5 C **6 Claims**

1. An aqueous drilling fluid consisting essentially of an aqueous phase containing clay solids dispersed therein by a ferrochrome lignosulfonate dispersant and containing a water soluble polyethoxylated sulfurized unsaturated fatty alcohol containing from about 16 to about 18 carbon atoms therein and wherein the number of ethylene oxide groups therein is on an average of from about 20 to about 25 and wherein the sulfur content is from about 4 to about 6% by weight, basis ethoxylated fatty alcohol moiety, said fatty alcohol being present in said drilling fluid in an amount of from about 0.5 to about 5 pounds per barrel and being effective to improve the lubricity of said drilling fluid without impairing its drilling fluid properties.

4,141,841
ANTISTATIC, FABRIC-SOFTENING DETERGENT ADDITIVE

Stephen R. McDanald, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 18, 1977, Ser. No. 816,761

Int. Cl.[2] **D06M** *13/46*

U.S. Cl. 252—8.8 **38 Claims**

1. A particulate detergent additive for preventing static buildup on textiles and softening fabrics when applied thereto from a detergent wash liquor, said particulate product being an agglomerate of:

(a) from about 5% to about 75% by weight of a water-soluble, neutral or alkaline salt, and

(b) from about 5% to about 75% of particles being an intimate mixture of

(i) from about 80% to about 20% by weight of the particles of a quaternary ammonium compound of formula $[R_1R_2R_3R_4N]^+Y^-$ wherein at least one but not more than two of R_1, R_2, R_3, and R_4 is an organic radical containing a group selected from a C_{16}–C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10 to 16 carbon atoms in the alkyl chain, the remaining group or groups being selected from C_1–C_4 alkyl, C_2–C_4 hydroxyalkyl, and cyclic structures in which the

nitrogen atom forms part of the ring, Y constituting an anionic radical selected from the group consisting of hydroxide, halide, sulfate, methylsulfate, ethylsulfate and phosphate ions, and

(ii) from about 20% to about 80% by weight of a dispersion inhibitor, being a solid organic material having a solubility in water of 50 ppm maximum at 25° C. and a softening point in the range of 100° F. to 200° F., said material being selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, esters of the foregoing alcohols and acids, C_3–C_4 alkylene oxide condensates of any of the foregoing materials and mixtures thereof, and

(c) from about 5% to about 75% by weight of an organic agglomerating agent, substantially all of the individual particles (b) having a size of about 10μ to about 50μ, and a solubility in water of about 50 ppm maximum at 25° C. and having a softening point of about 100° F. to about 200° F.

4,141,842

WATERFLOOD OIL RECOVERY PROCESS EMPLOYING STABILIZED BIOPOLYMERS

Milton K. Abdo, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,141
Int. Cl.² E21B *43/22*
U.S. Cl. 252—8.55 D **10 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir having a temperature greater than 60° C. and penetrated by spaced injection and production systems wherein an aqueous liquid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system a viscous aqueous liquid containing a water dispersible polysaccharide produced by action of bacteria of the genus Xanthomonas on a carbohydrate, a C_4–C_5 aliphatic alcohol in a concentration within the range of 0.1–2.0 volume percent, and an alkali metal carbonate in a concentration within the range of 0.001–0.1 weight percent.

4,141,843

OIL WELL SPACER FLUIDS

Jimmie L. Watson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 20, 1976, Ser. No. 725,068
Int. Cl.² E21B *43/00*
U.S. Cl. 252—8.55 R **11 Claims**

1. A high stability nondamaging fluid for maintaining a hydrostatic pressure on a subterranean formation intersected by a well comprising water, a viscosifier which is present in an effective concentration to suspend weighting agent, said viscosifier being selected from a hydratable hydroxy alkyl substituted cellulose polymer wherein the hydroxy alkyl substituents have 2–3 carbon atoms; an inhibitor which is present in an effective concentration to inhibit clay swelling comprising at least one water soluble halide salt of alkali metal, alkaline earth metal or ammonium; a water insoluble, relatively inert finely divided particulate solid weighting agent having a mean particle size in the range of about 2–20 microns, said weighting agent being present in a concentration to give the desired fluid density; and a dispersant having a concentration of less than about 1.5% by weight of said fluid, said dispersant comprising at least one or a combination of a condensation product of naphthalene sulfonate and formaldehyde or a fatty acid amide-lignin liquor mixture, wherein the fatty acid precursor contains about 14–18 carbon atoms, the amine precursor is a low molecular weight amino sulfonic acid having 1–6 carbon atoms and the lignin is sulfonated.

4,141,844

SYNTHETIC AIRCRAFT TURBINE OIL

Roberta Yaffe, Glenham, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,714
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.7 **10 Claims**

1. A synthetic lubricating oil composition for a gas turbine engine consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

from about 0.3 to 5 percent by weight of the lubricating oil composition of an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms and the alkaryl radical has from 7 to 12 carbon atoms,

from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms,

from about 0.001 to 1 percent by weight of a polyhydroxy-substituted anthraquinone,

from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

from about 0.005 to 0.1 percent by weight of an S-alkyl-2-mercaptobenzimidazole containing from 1 to about 20 carbon atoms in the alkyl portion, linear or branched.

4,141,845

SYNTHETIC AIRCRAFT TURBINE OIL

Roberta Yaffe, Glenham, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,717
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.7 **10 Claims**

1. A synthetic lubricating oil composition for a gas turbine engine consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

from about 0.3 to 5 percent by weight of the lubricating oil composition of an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms and the alkaryl radical has from 7 to 12 carbon atoms,

from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms,

from about 0.001 to 1.0 percent by weight of a polyhydroxy substituted anthraquinone,

from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 8 carbons atoms, and

from about 0.005 to 0.2 percent by weight of an S-alkyl-2-mercaptobenzothiazole containing from 1 to about 20 carbon atoms in the alkyl portion, linear or branched.

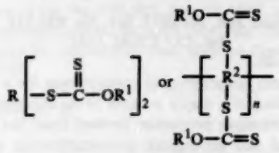
4,141,846

LUBRICANT ADDITIVE

Gerald J. J. Jayne, Wokingham, and Herbert F. Askew, Reading, both of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

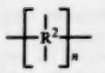
Filed Mar. 15, 1977, Ser. No. 777,774
Claims priority, application United Kingdom, Mar. 26, 1976, 12302/76
Int. Cl.² C10M *1/38*
U.S. Cl. 252—48.2 **24 Claims**

1. A compound or mixture of compounds having the formula



(I) (II)

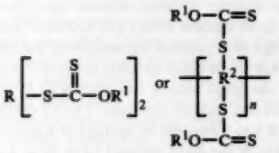
wherein in Formula (I) R is the residue of an intramolecular sulfur-bridged hydrocarbon ring containing from 6 to 12 carbon atoms or wherein in Formula



(II)

is a polymer comprising the residue of a plurality of n substantially intermolecularly sulfur-bridged hydrocarbon rings each containing from 6 to 12 carbon atoms, n being the degree of polymerization, each R^1 is the same or different and is an alkyl, alkenyl, aralkyl, aryloxyalkyl or an alkoxyalkyl group having the formula $[R^4O]_mR^5$ wherein R^4 is a divalent alkylene radical containing 2-6 carbon atoms, R^5 is an alkyl radical containing 1-6 carbon atoms or an aryl radical containing 6-10 carbon atoms, and m is an integer from 1-6, at least about 20 mole percent of R^1 being said aryloxyalkyl or alkoxyalkyl group.

17. A lubricating oil composition comprising a major amount of a lubricating oil and a minor amount of a compound or mixture of compounds having the formula



(I) (II)

wherein in Formula (I) R is the residue of an intramolecular sulfur-bridged hydrocarbon ring containing from 6 to 12 carbon atoms or wherein in Formula

(II)

is a polymer comprising the residue of a plurality of n substantially intermolecularly sulfur-bridged hydrocarbon rings each containing from 6 to 12 carbon atoms, n being the degree of polymerization, each R^1 is the same or different and is an alkyl, alkenyl, aralkyl, aryloxyalkyl or an alkoxyalkyl group having the formula $[R^4O]_mR^5$ wherein R^4 is a divalent alkylene radical containing 2-6 carbon atoms, R^5 is an alkyl radical containing 1-6 carbon atoms or an aryl radical containing 6-10 carbon atoms, and m is an integer from 1-6, at least about 20 mole percent of R^1 being said aryloxyalkyl or alkoxyalkyl group.

4,141,847

STAR-SHAPED POLYMER REACTED WITH DICARBOXYLIC ACID AND AMINE AS DISPERSANT VISCOSITY INDEX IMPROVER

Thomas E. Kiovsky, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 11, 1977, Ser. No. 795,675
Int. Cl.[2] C10M *1/36, 3/30;* **C08L** *9/06*
U.S. Cl. 252—51.5 A **14 Claims**

1. The oil-soluble product prepared by the process comprising:

a. reacting a selectively hydrogenated star-shaped polymer with an excess of an alpha-beta unsaturated carboxylic acid, anhydride or ester at a temperature of between about 150° C. and about 300° C. for between about 1 hour and about 20 hours wherein said star-shaped polymer comprises a poly (polyalkenyl coupling agent) nucleus and between about 7 and about 15 polymeric arms linked to said nucleus wherein said polymeric arms are selected from the group consisting of:

i. hydrogenated homopolymers and hydrogenated copolymers of conjugated dienes;

ii. hydrogenated copolymers of conjugated dienes and monoalkenyl arenes; and

iii. mixtures thereof;

and wherein at least about 80% of the aliphatic unsaturation of the star-shaped polymer has been reduced; and

b. reacting the product of step (a) with a C_1 to C_{18} amine containing 1 to 8 nitrogen atoms at a temperature of between about 150° C. and about 250° C. wherein the molar ratio of amine to carboxylic acid, anhydride or ester is between about 0.1:1 and about 2:1.

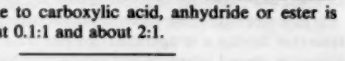
4,141,848

ORGANIC COMPOSITIONS CONTAINING ESTERS OF ARYL AMINOARYLOXYALKANOLS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,753
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A **31 Claims**

1. A new composition of matter comprising an ester of an arylaminoaryloxyalkanol, said arylaminoaryloxyalkanol being characterized by the formula:



wherein:

Ar and Ar' are individually selected from the group consisting of phenyl and naphthyl; and

n is a number within the range of 1 to 12.

11. A composition of matter comprising a mixture of an ester of an arylaminoaryloxyalkanol and a diarylamine.

17. An organic composition comprising a major amount of an organic material subject to oxidative deterioration and a minor and sufficient amount of an oxidation inhibitor to inhibit the oxidation of said organic material, said oxidation inhibitor being an ester of an arylaminoaryloxyalkanol, said ester being derived from a monobasic acid characterized by the following formula:

wherein

Ar and Ar' are individually selected from the group consisting of phenyl and naphthyl;

n is a number within the range of 1 to 12; and

R is selected from the group consisting of alkyl groups of 1 to 12 carbon atoms of straight or branched chain and aralkyl groups.

4,141,849

DEVELOPER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Tetsuo Hasegawa, Tokyo; Hitoshi Touma, Kawasaki; Kunio Satomi, Yokohama, and Tatsuo Miyamae, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,526

Int. Cl.[2] G03G 9/08

U.S. Cl. 252—62.1 P **14 Claims**

1. A developer for developing electrostatic latent images comprising toner particles and finely divided graphite fluoride, wherein the amount of graphite fluoride is 0.001–10% by weight based on the toner, and the degree of fluorination of the graphite fluoride is at least 50%.

13. A toner for developing electrostatic latent images which comprises a colorant selected from dye and pigment and graphite fluoride in a resin, wherein the amount of graphite fluoride is 0.001–10% by weight and the degree of fluorination of the graphite fluoride is at least 50%.

4,141,850

DISSOLUTION OF METALS

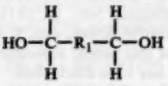
Philip D. Readio, Sparta, and John L. H. Allan, Glen Rock, both of, NJ, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,574

Int. Cl.[2] C09K 13/06; C23F 1/00, 3/00

U.S. Cl. 252—79.4 **25 Claims**

1. In a process for the dissolution of metal in which a metal is contacted with an aqueous solution containing free chloride or bromide ions, from about 0.2 to about 4.5 gram moles per liter of sulfuric acid and from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the method of increasing the metal dissolution rate of the solution in the presence of chloride or bromide ions to a value higher than that obtained by such a solution free of any chloride and bromide ions, which method comprises adding an effective amount of a primary diol promoter having the general formula:



wherein R_1 is selected from:

(a) $-(C\ R_2\ R_3)_n-$, where each R_2 and R_3 independently from each other is either hydrogen or an alkyl group of 1 to 4 carbon atoms, and n is at least 2, or

(b) a cycloparaffinic group or an alkyl-substituted cycloparaffinic group having from 5 to 7 carbon atoms in the ring structure and from 1 to 4 carbon atoms in any of the alkyl substitutions.

4,141,851

SILANE DERIVATIVES

Herbert F. Askew, Wokingham; Colin J. Harrington, Reading, and Gerald J. J. Jayne, Wokingham, all of England, assignors to Castrol Limited, Wiltshire, United Kingdom

Continuation of Ser. No. 742,995, Nov. 18, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,912

Claims priority, application United Kingdom, Nov. 21, 1975, 48009/75

Int. Cl.[2] C09K 3/00; C07F 7/18

U.S. Cl. 252—78.3 **23 Claims**

1. A silane derivative having the general formula:

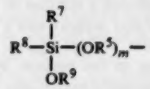
I

wherein:

(a) R is a group of the formula $R^4—(OR^5)_m—OR^6—$;

(b) each of R^1 and R^2 is independently alkyl, alkenyl, aryl, alkaryl or aralkyl, a group of the formula $-OR^3$ or a group of the formula $R^4—(OR^5)_m—OR^6—$;

(c) R^3 is a group of the formula R^4-$(OR^5)_m$- or a group of the formula:



and each R^3 may be the same as or different from any other group R^3;

(d) R^4 is alkyl, alkenyl, aryl, alkaryl or aralkyl and each R^4 may be the same as or different from any other group R^4;

(e) R^5 is an alkylene group and each R^5 may be the same as or different from any other group R^5;

(f) R^6 is an alkylene group and each R^6 may be the same as or different from any other group R^6;

(g) m is an integer and each m may be the same as or different from any other m;

(h) each of R^7 and R^8 is independently alkyl, alkenyl, aryl, alkaryl or aralkyl, a group of the formula $—OR^9$ or a group of the formula $R^4—(OR^5)_m—OR^6—$; and

(i) R^9 is a group of the formula $R^4—(OR^5)_m—$ and each R^9 may be the same as or different from any other group R^9.

23. A hydraulic fluid comprising at least one conventional hydraulic fluid additive and/or base stock and a silane derivative having the general formula:

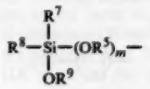
I

wherein:

(a) R is a group of the formula $R^4—(OR^5)_m—OR^6—$;

(b) each of R^1 and R^2 is independently alkyl, alkenyl, aryl, alkaryl or aralkyl, a group of the formula $-OR^3$ or a group of the formula $R^4—(OR^5)_m—OR^6—$;

(c) R^3 is a group of the formula R^4-$(OR^5)_m$- or a group of the formula:



and each R^3 may be the same as or different from any other group R^3;

(d) R^4 is alkyl, alkenyl, aryl, alkaryl or aralkyl and each R^4 may be the same as or different from any other group R^4;

(e) R^5 is an alkylene group and each R^5 may be the same as or different from any other group R^5;

(f) R^6 is an alkylene group and each R^6 may be the same as or different from any other group R^6;

(g) m is zero or an integer and each m may be the same as or different from any other m;

(h) each of R^7 and R^8 is independently alkyl, alkenyl, aryl, alkaryl or aralkyl, a group of the formula $—OR^9$ or a group of the formula $R^4—(OR)^5{}_m—OR^6—$; and

(i) R^9 is a group of the formula $R^4—(OR^5)_m—$ and each R^9 may be the same as or different from any other group R^9.

4,141,852

METHOD OF STABILIZING A MIXTURE OF LOW AND HIGH MOLECULAR WEIGHT POLYETHERS

James M. Hogan, Tallmadge, and John R. White, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 15, 1977, Ser. No. 824,366
Int. Cl.[2] C08K *5/20*
U.S. Cl. 252—182 **4 Claims**

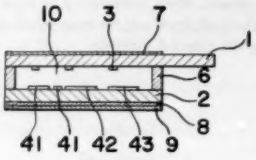
1. A method of stabilizing a mixture of a monomeric polyol of less than 500 molecular weight and a polyether polyol of 1800 to 7000 molecular weight against gravity separation, comprising adding one to ten percent by weight of grafted polypropylene ether polyol of two to four hydroxyls of 1500 to 3500 molecular weight to said mixture, said grafted polypropylene ether polyol containing less than 30 percent by weight of a grafting monomer of acrylonitrile or acrylonitrile and styrene.

4,141,853

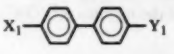
LIQUID CRYSTAL MATERIAL

Shinichi Hibino, Nara; Takaaki Miyazaki, Hommachi, and Keiji Nakayama, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

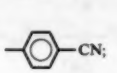
Filed Oct. 6, 1977, Ser. No. 840,031
Claims priority, application Japan, Oct. 6, 1976, 51/120540; Nov. 30, 1976, 51/146020
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 252—299 **2 Claims**



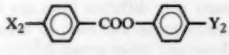
1. A liquid crystal composition which exists in a nematic mesophase at a temperature of at least −10° C. to 50° C. and which has a net positive dielectric anisotropy consisting essentially of (A) at least one of the compounds represented by the formula:



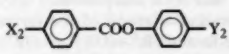
wherein X_1 is $C_nH_{(2n+1)}$ or $C_nH_{(2n+1)}O$, n being a number from 4 to 8, and Y_1 is —CN or



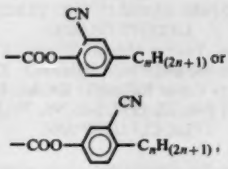
and (B)(1) at least one of the compounds represented by the formula:



wherein X_2 is $C_nH_{(2n+1)}O$ or $C_nH_{(2n+1)}$, and Y_2 is $C_nH_{(2n+1)}O$ or $C_nH_{(2n+1)}$, and (2) at least one of the compounds represented by the formula:



wherein X_2 is $C_nH_{(2n+1)}O$ or $C_nH_{(2n+1)}$, and Y_2 is



n being a number from 1 to 8, wherein the proportion of (A) to (B) is 1—X:X where X is from 0.4 to 0.6.

4,141,854

EMULSION BREAKING

Audrone M. Pavilcius, Chicago, and Mary Ann Latko, Summit, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 801,894, May 31, 1977, abandoned. This application Dec. 14, 1977, Ser. No. 860,542
Int. Cl.[2] G21F *9/04*; B01D *17/04*
U.S. Cl. 252—301.1 W **2 Claims**

1. A method of resolving water-in-oil emulsions resulting from the organic solvent extraction of uranium from aqueous leach liquors which comprises treating said emulsions at a temperature between room temperature and the boiling point of the emulsions with at least 20 parts per million of a water-soluble acrylamide copolymer which contains from 5–50% by weight of a lower alkyl substituted tertiary aminoethyl methacrylate and quaternary ammonium salts thereof.

4,141,855

METHOD OF PRODUCING CERIUM-ACTIVATED PHOSPHOR OF IMPROVED CHARACTERISTIC

Tetsuhiko Tomiki; Takeshi Takeda; Takeo Miyata, and Fumio Muramatsu, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 691,784, Jun. 1, 1976, Pat. No. 4,070,301. This application Nov. 10, 1977, Ser. No. 850,253
Claims priority, application Japan, Jun. 2, 1975, 50–66824. The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 R **6 Claims**

1. A method of producing a $YAlO_3$:Ce phosphor, comprising the steps of:

a. preparing a mixture of Y_2O_3, Al_2O_3 and CeO_2, the molar ratio of Y_2O_3 to Al_2O_3 being substantially 1:1, the amount of CeO_2 being such that cerium in said phosphor amounts to 0.1 to 5 mole% of $YAlO_3$;

b. adding a barium compound selected from the group consisting of BaO, $BaCO_3$, BaF_2, $BaCl_2$ and barium salts which yield BaO at a temperature below 1400° C. to said mixture in an amount of 0.1 to 20 mole% of said mixture;

c. baking the resultant mixture at a temperature in the range from about 1000° to about 1400° C.; and

d. washing the product of step (c) with an acid when said amount of said barium compound is larger than 8 mole%.

4. A method of producing a $YAlO_3$:Ce phosphor, comprising the steps of:

a. preparing a mixture of Y_2O_3, Al_2O_3, CeO_2 and at least one of YF_3 and AlF_3, the molar ratio of $(2YF_3 + Y_2O_3)$ to $(2AlF_3 + Al_2O_3)$ being substantially 1:1, with the molar ratios $2YF_3/Y_2O_3$ and $2AlF_3/Al_2O_3$ being each in the range from 0.001 to 0.10 when YF_3 or AlF_3 is present, or with the sum of the molar ratios $2YF_3/Y_2O_3$ and $2AlF_3/Al_2O_3$ being in the range from 0.001 to 0.10 when both YF_3 and AlF_3 are present; the amount of CeO_2 being such that cerium in said phosphor amounts to 0.1 to 5 mole% of $YAlO_3$;

b. adding a barium compound selected from the group consisting of BaO, $BaCO_3$, BaF_2, $BaCl_2$ and barium salts

which yield BaO at a temperature below 1400° C. to said mixture in an amount of 0.1 to 20 mole% of said mixture;
c. baking the resultant mixture at a temperature in the range from about 1000° to about 1400° C.; and
d. washing the product of step (c) with an acid when said amount of said barium compound is larger than 8 mole%.

4,141,856

REFERENCE MATERIAL FOR ESTABLISHING ANION CONCENTRATIONS IN ANALYTICAL CHEMISTRY TESTS

William V. Dorwart, Jr., 124 Maple Ave., Bala Cynwyd, Pa. 19004, and Walter Brummund, Jr., 4033 Spruce St., Philadelphia, Pa. 19104

Continuation-in-part of Ser. No. 689,242, May 24, 1976, abandoned. This application May 9, 1977, Ser. No. 794,864

Int. Cl.[2] C09K *3/00;* **G01N** *33/16, 33/00*

U.S. Cl. 252—408 **21 Claims**

1. A composition capable of use as a component of a clinical control material, comprising water and at least one water-soluble quaternary ammonium carbonate or bicarbonate, said composition including no substance which will affect assays for sodium, potassium, calcium, ammonium, chloride and iron ions.

12. A dry composition comprising at least one dried animal body fluid and at least one water-soluble quaternary ammonium carbonate or bicarbonate.

19. A method for making a clinical control material which comprises mixing an aqueous solution of a water-soluble quaternary ammonium carbonate or bicarbonate and an animal body fluid and then lyophilizing the mixture.

4,141,857

SUPPORT MATRICES FOR IMMOBILIZED ENZYMES

Joseph Levy, Northbrook, Ill., and Murray C. Fusee, Ellicott City, Md., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 681,987, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 550,898, Feb. 18, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 842,993

Int. Cl.[2] B01J *31/06*

U.S. Cl. 252—430 **14 Claims**

1. A process for the preparation of a support matrix for immobilization of enzymes which comprises treating an inorganic porous support material selected from the group consisting of gamma-alumina, silica, zirconia, silica-magnesia, silica-zirconia-alumina, and silica-alumina, said material possessing pore diameters of from about 100 to about 55,000 Angstroms and a surface area of from about 1 to about 500 square meters per gram, with a solution of water soluble polyamines selected from the group consisting of ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine, pentaethylenehexamine, hexamethylenediamine, and polyethyleneimine, removing unabsorbed polyamines after said treatment, contacting the treated support material with a solution containing a molar excess of a bifunctional monomeric material selected from the group consisting of glutaraldehyde and toluenediisocyanate, wherein said bifunctional monomer reacts with said polyamine material absorbed on said support, removing unreacted bifunctional monomeric material solution, and recovering the resultant inorganic-organic support matrix.

4,141,858

PASSIVATING METALS ON CRACKING CATALYSTS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 671,231, Mar. 29, 1976, abandoned. This application Jul. 26, 1977, Ser. No. 819,027

Int. Cl.[2] B01J *27/02, 27/14*

U.S. Cl. 252—439 **9 Claims**

1. A modified cracking catalyst obtained by contacting a clay based cracking catalyst and at least one passivating compound selected from the group consisting of antimony selenide, antimony sulfide, antimony sulfate, bismuth selenide, bismuth sulfide and bismuth phosphate under elevated temperature conditions.

4,141,859

NOVEL REFORMING CATALYSTS

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, and Edwin N. Givens, Pitman, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 503,131, Sep. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 262,410, Jun. 13, 1972, abandoned. This application Jan. 5, 1977, Ser. No. 757,113

Int. Cl.[2] B01J *29/06, 27/06*

U.S. Cl. 252—455 Z **18 Claims**

1. A reforming catalyst system in which the total catalyst comprises (1) from about 1 to about 100% of a composite comprising
(a) an effective amount, up to about 25% by wt. of a crystalline aluminosilicate zeolite of controlled acidity, the aluminosilicate being selected from the group consisting of ZSM-5, ZSM-35 and TEA-mordenite,
(b) not less than about 75%, by weight, of a carrier material,
(c) from about 0.01% to about 2%, by weight, of a platinum group metal either alone or in combination with other metals, and
(d) from about 0.01 to about 3%, by weight, of a halide
and (2) from 0% to about 99% of a conventional reforming catalyst composition comprising
(e) a carrier material,
(f) from about 0.01% to about 2%, by weight, of a platinum group metal either alone or in combination with other metals, and
(g) from about 0.01% to about 3%, by weight, of a halide
said total catalyst system having a K factor from about 1.5 to about 15, this factor being as defined in the specification in equations 2 and 3.

4,141,860

HYDROCRACKING CATALYST

Mark J. O'Hara, Mt. Prospect; Russell W. Johnson, Hoffman Estates, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 30, 1977, Ser. No. 838,435

Int. Cl.[2] B01J *29/06;* **C10G** *13/02*

U.S. Cl. 252—455 Z **7 Claims**

1. A hydrocracking catalyst composition comprising an alumina-zeolite support, a rare earth exchange metal component, at least one metal component from Group VIB or Group VIII and from about 0.1 to about 5 wt. % of at least one component from Group IIA based on the weight of the finished catalyst.

4,141,861

GELS CONTAINING IRON AND MOLYBDENUM

Philippe Courty, Nanterre; Hubert Ajot, Le Fontanil, and Bernard Delmon, Seyssins, all of France, assignors to Institut Francais du Petrole, France

Continuation-in-part of Ser. No. 541,404, Jan. 16, 1975, Pat. No. 4,000,085, which is a continuation of Ser. No. 8,063, Feb. 2, 1970, abandoned, and Ser. No. 403,123, Oct. 3, 1973, abandoned, which is a continuation of Ser. No. 888,725, Dec. 29, 1969, abandoned. This application Apr. 19, 1976, Ser. No. 678,306

Int. Cl.[2] B01J *23/10*

U.S. Cl. 252—462 **23 Claims**

1. An amorphous and transparent solid gel consisting essen-

tially of (a) ions from a ferric salt and ions from at least one salt containing as simple cations a metal M selected from the group consisting of cobalt, nickel, manganese, chromium, scandium, yttrium and the rare earth metals, in an atomic ratio M/(Fe + M) from 0 to 0.5:1; (b) ions from a molybdic acid or an ammonium molybdate and ions from at least one salt containing as oxygenated ions a metal N selected from the group consisting of chromium, tungsten, manganese, and vanadium, in an atomic ratio N/(Mo + N) from 0 to 0.5:1; and (c) 0 to 80% by weight of water; wherein ferric ions, metal M-ions, molybdate ions and oxygenated metal N-ions are in an atomic ratio (Mo + N)/(Fe + M) from 0.4:1 to 5:1.

4,141,862

CATALYST COMBINATION FOR POLYURETHANES

Daniel S. Raden, Mt. Prospect; Morton A. Weiner, Waukegan, and Douglas W. Hill, Fox Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 667,238, Mar. 15, 1976. This application Oct. 25, 1977, Ser. No. 844,675

Int. Cl.[2] C08J 9/00

U.S. Cl. 521—129 **7 Claims**

1. A process for the preparation of a polyurethane consisting essentially in reacting an organic monomeric or polymeric polyisocyanate with an organic monomeric or polymeric polyol and a blowing agent in the presence of a catalyst containing 1,3,5-tris(3-dimethylaminopropyl)-sym-hexahydrotriazine and 2-(dimethylamino)ethanol in a weight ratio of between 9:1 and 1:9, said catalyst being present in amounts of 0.05–5.0 parts by weight per 100 parts by weight of said polyol.

4,141,863

THERMOPLASTIC COMPOSITIONS OF RUBBER AND POLYESTER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 695,021, Jun. 11, 1976, abandoned. This application May 5, 1978, Ser. No. 903,092

Int. Cl.[2] C08L 7/00

U.S. Cl. 260—3 **24 Claims**

1. An elastoplastic composition comprising a blend of

a. thermoplastic linear crystalline polyester having a softening point above 50° C. in an amount sufficient to impart thermoplasticity up to 50 weight percent of the composition,

b. rubber cross-linked to the extent that the gel content of the rubber is at least about 80 percent, the rubber being a homopolymer of 1,3-butadiene, a copolymer of 1,3-butadiene copolymerized with styrene, vinyl pyridine, acrylonitrile, or methacrylonitrile, a natural or synthetic polymer of isoprene, a urethane polymer or a copolymer of two or more alpha monoolefins optionally copolymerized with a minor quantity of diene or mixtures of said polymers, said rubber being in an amount sufficient to impart rubberlike elasticity up to 85 weight percent of the composition,

which composition is processable as a thermoplastic and is elastomeric.

4,141,864

OSSEOUS CEMENT COMPOSITION

Arie Rijke, Velsen, Netherlands; Sue McCoy, Gordonsville, and Robert E. McLaughlin, Charlottesville, both of Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 451,480, Mar. 15, 1974, abandoned. This application Dec. 16, 1977, Ser. No. 861,295

Int. Cl.[2] A61K 5/06; C08L 33/10

U.S. Cl. 260—17.4 SG **6 Claims**

1. An osseous cement for orthopedic or dental application which comprises:

the admixture of 10–40% by weight of organic or inorganic particles leachable by the extracellular fluid of the host which are of particle size 50–250μ (average) and are present in an amount within said range of 10–40% such that they form a continuous pore system in the cement when leached from the cement in situ, 20–40% by weight of an acrylic monomer, 35–65% by weight of an insoluble particulate filler of negligible diffusion from the mixture which is non-toxic, non-carcinogenic, non-degrading, non-swellable in body fluids, chemically stable, biologically inert, has appropriate mechanical qualities so as to be capable of raising the viscosity of the composition to a pliable, moldable paste having a particle size of less than 100μ, and a means for initiating polymerization of said acrylic monomer, wherein said leachable particles in addition:

1. have approximately the same pH as the extracellular fluid;
2. have substantially no effect on the ionic strength of the extracellular fluid;
3. are non-toxic;
4. are hard and relatively non-deformable such that the particles maintain the proper size porosity of the deposited cement;
5. have a melting point above the polymerization temperature of said acrylic monomer; and
6. are not soluble or swellable in the monomer or subsequent polymer.

4,141,865

CATALYSTS FOR REACTION OF CARBOXYLIC ACIDS WITH POLYEPOXIDES

Gary W. Bogan, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1977, Ser. No. 839,970

Int. Cl.[2] C08L 63/00

U.S. Cl. 260—18 EP **10 Claims**

1. In the process for preparing a curable resin composition by the catalytic induced simultaneous reaction of a polyglycidyl ether and carboxylic acids consisting essentially of at least one dicarboxylic acid and at least one ethylenically unsaturated monocarboxylic acid, all of stated ingredients being in stoichiometric equivalency of epoxy to carboxyl groups, the improvement wherein said reaction mixture is heated to an elevated temperature in contact with a catalyst composed of about 0.2 to 0.5 mole of triphenyl phosphine and about 0.2 to 0.5 mole chromium triacetate per equivalent of polyglycidyl ether until reaction is substantially complete.

4,141,866

SOAPS AND ESTER-SOAPS OF α-ALKYL BRANCHED MONOCARBOXYLIC ACIDS

Harold C. Foulks, Jr., Newport, Ky., assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 722,990, Sep. 13, 1976, and a continuation-in-part of Ser. No. 535,603, Dec. 23, 1974, Pat. No. 4,029,683. This application Jan. 23, 1978, Ser. No. 871,354

Int. Cl.[2] C08K 5/10; C08H 3/00; C09F 5/08; C11C 3/02

U.S. Cl. 260—23 XA **11 Claims**

1. An ester-soap derived from an aliphatic hydroxylic compound having from 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and an α-alkyl branched aliphatic monocarboxylic acid having at least 25 carbon atoms and obtained by the free radical addition of a short-chain saturated aliphatic monocarboxylic acid having from 3 to 12 carbon atoms and a mixture of olefins containing 22 to 100 carbon atoms with 85% by weight or more of the olefins having from 22 to 60 carbon atoms and partially saponified with a metal selected from the group consisting of an alkali metal, alkaline earth metal, amphoteric metal and heavy metal, said ester-soap containing from about 0.5 to 2.5 weight percent of the metal.

7. A thermoplastic resin composition containing 0.1 to 5 parts per 100 parts resin of an ester-soap derived from an aliphatic hydroxylic compound containing 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl atoms and an alpha-alkyl branched aliphatic monocarboxylic acid and par-

tially saponified with an alkali metal, alkaline earth metal, amphoteric metal or heavy metal, said alpha-alkyl monocarboxylic acid having at least 25 carbon atoms and obtained by the free radical addition of a short-chain saturated aliphatic monocarboxylic acid having from 3 to 12 carbon atoms and a mixture of alpha-olefins containing from 22 to 100 carbon atoms with 85% by weight or more of the olefins having from 22 to 60 carbon atoms.

4,141,867

COLD CROSS-LINKING DISPERSION ADHESIVE

Gundolf Fuchs, Hemmingstedt; Heiko Humbert, Hamburg, and Dietrich Pirck, Seevetal, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,636

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636970

Int. Cl.[2] C08J *3/24*; C08K *5/10*

U.S. Cl. 260—23 AR **4 Claims**

1. Cold cross-linkable polyacrylic acid ester based adhesives comprising an aqueous dispersion having a solids content of from about 40 to 60 wt. % and a viscosity in the range of from 800 to 100 CPS containing:

(a) a copolymer prepared from, in wt. %, 85–50 2-ethyl-hexylacrylate, 0-35 n-butylacrylate, 8–12 acrylonitrile, 2–6 acrylic acid, 0.5–2 acrylamide and from 0 to 2 hydroxyalkylmethacrylate and, based on the amount of the aforementioned monomers, from 0.2–3 of a 2-(α-chloroacetoxy) -alkyl-acrylate or methacrylate,

(b) 1–5 wt. %, based on the weight of the copolymer of a polyaminoamide having a molecular weight of about 1000 to 8000 containing terminal amino groups and

(c) rosin, or fillers.

4,141,868

WATER-BASED COATING COMPOSITIONS

William D. Emmons, Huntingdon Valley, and Kayson Nyi, Sellersville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

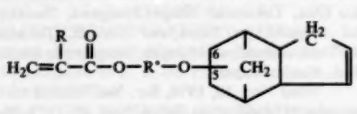
Continuation-in-part of Ser. No. 703,348, Jul. 7, 1976, Pat. No. 4,097,677. This application Jun. 14, 1977, Ser. No. 806,572

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 AR **15 Claims**

1. A composition adapted to coat and/or impregnate a substrate comprising an aqueous dispersion of a vinyl addition polymer, about 1% to 200% by weight, based on the weight of dispersed polymer, of an ester-ether monomer of formula I herein, and from 0.0005% to 2% by weight, based on the weight of formula I monomer component, of a drier, formula I being as follows:



wherein

R is H or CH_3, and

R° is an alkylene group having 2 to 12 carbon atoms or an oxaalkylene group having at least 4 to 12 carbon atoms and having at least one oxygen atom joining distinct segments of the alkylene group, each such segment having at least 2 carbon atoms.

3. A composition according to claim 1 wherein from 1% to about 33 ⅓% by weight of the formula I monomer component is replaced by a drying oil fatty acid or a salt thereof.

4,141,869

HEAT-SEALING THERMOPLASTIC ADHESIVE

Georg Hoss, Meckenheim, and Eduard de Jong, St. Augustin, both of Fed. Rep. of Germany, assignors to Plate Bonn Gesellschaft mit beschrankter Haftung, Bonn, Fed. Rep. of Germany

Filed Sep. 28, 1976, Ser. No. 727,512

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545874

Int. Cl.[2] C08L *77/00*; C08K *5/54*; C08J *69/44*

U.S. Cl. 260—29.15 B **12 Claims**

1. A heat-sealing thermoplastic adhesive of a thermoplastic polymer which is resistant to washing and dry-cleaning, selected from the group consisting of

(a) copolyamides containing about 80 to 20% by weight of lauric lactam and 20 to 80% by weight of at least one other polyamide forming material;

(b) copolyamides containing 25 to 35% by weight of caprolactam; 20 to 40% by weight of lauric lactam; 8 to 25% by weight of hexamethylene diamine adipate and from 10 to 40% by weight of the hexamethylene diamine salt of the acid of formula I, HOOC—$(CH_2)_n$—COOH in which n = 7, 8, 10 or 11;

(c) copolyamides containing 30% by weight of caprolactam; 30 to 35% by weight of lauric lactam and 10 to 15% by weight of hexamethylene diamine adipate;

(d) a copolyamides containing 30% by weight of caprolactam; 30 to 35% by weight of lauric lactam; and 15 to 35% by weight of the hexamethylene diamine salt of the acid of formula I;

(e) copolyamides of a polyamide-forming amide salt containing at least 10 carbon atoms, a polyamide forming w-amino acid and, optionally, a polyamide forming lactam;

(f) copolyamides of a polyamide-forming amide salt containing at least 10 carbon atoms and a polyamide-forming lactam and crystallisable copolyesters based on terephthalic acid/diol;

which contains from about 0.05 to about 5% by weight, based on the weight of said polymer, of at least one hydrophobic organosilicon polymer selected from the group consisting of polyorganosiloxanes, silicones, polysilalkylenes, polysilarylenes, polyorganosilazanes and polyorganooxysiloxanes.

4,141,870

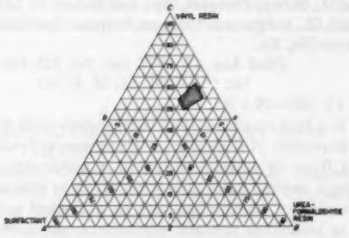
STABLE, WATER-BORNE VINYL CHLORIDE RESIN EMULSION COMPOSITIONS

Richard J. Burns, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,869

Int. Cl.[2] C08L *61/24*

U.S. Cl. 260—29.4 UA **7 Claims**



1. Stable water-borne emulsion composition suitable for coating substrates consisting essentially of:

(A) about 55 to 67% by weight of a normally solid vinyl chloride resin selected from the group consisting of:

(a) vinyl chloride/vinyl acetate/vinyl alcohol terpolymers containing about 75 to about 91 weight % vinyl chloride, about 10 to about 25 weight % vinyl acetate and about 1 to about 15 weight % vinyl alcohol copolymerized therein;

(b) a vinyl chloride terpolymer having copolymerized therein about 75 to about 91 weight % of vinyl chloride, about 10 to about 25 weight % vinyl acetate and about 1 to about 15 weight % of a comonomer selected from the class consisting of maleic acid, fumaric acid or crotonic acid;

(c) a vinyl chloride terpolymer having copolymerized therein about 75 to about 91 weight % of vinyl chloride, about 10 to about 25 weight % vinyl acetate and about 1 to about 15 weight % of a comonomer selected from the group consisting of glycidyl or hydroxyalkyl acrylate or methacrylate having 2 to 3 carbons in the alkyl group; and

(d) a mixture of (b) plus (c) wherein the ratio of (b) to (c) is about 1:1 to about 1:3;

(B) about 6 to about 17 weight % of a nonionic surfactant having an HLB of about 15 to about 20; and

(C) about 24 to about 33 weight % of a water-immiscible, solvent-free, normally liquid urea-formaldehyde resin which has undergone transetherification with n-butanol or isobutanol; wherein the sum of (A) + (B) + (C) = 100%; and

(D) about 2 to about 20 parts per 100 parts by weight of (A) + (B) + (C) of an oxygenated hydrocarbon solvent or blend of solvents for said vinyl chloride resin (A), having a relative evaporation rate of about 3 to about 35 and a maximum water solubility of about 2 or less grams per 100 grams of water; wherein the combination of (A), (B), (C) and (D) has been emulsified in sufficient water, as the continuous phase, to afford an internal solids content of up to about 50 weight %.

4,141,871

AQUEOUS DISPERSIONS OF POLYHYDROXY POLYETHER RESINS AS COATING COMPOSITIONS FOR METALLIC SUBSTRATES

David A. Shimp, Prospect, Ky., and Robert B. Mitzel, Springfield, Ill., assignors to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Aug. 17, 1977, Ser. No. 825,366

Int. Cl.[2] C08L *61/28, 61/10*

U.S. Cl. 260—29.4 R **12 Claims**

1. In a heat curable coating composition made from an aqueous dispersion of a complex polyhydroxy polyether resin derived from an epihalohydrin and a polyhydric phenol and having a melting point of at least 50° C. in admixture with an aminoplast or phenolplast resin or a blocked polyisocyanate and an anionic or nonionic surfactant or mixture thereof, the improvement which comprises using as a diluent in the dispersion an emulsion of a water immiscible butanol in water plus an anionic or nonionic surfactant or mixture thereof wherein the butanol is present in the amount of about 5 to about 30 weight percent based on the weight of the total volatiles in the coating composition and wherein the coating composition has a surface tension of about 26 to about 28 dynes per centimeter at 25° C.

4,141,872

RAPID CURING MELAMINE-FORMALDEHYDE RESIN COMPOSITION

Kenneth D. Bunkowski, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Division of Ser. No. 746,445, Dec. 1, 1976, Pat. No. 4,076,896, which is a continuation of Ser. No. 697,083, Jun. 16, 1976, abandoned, which is a continuation of Ser. No. 600,012, Jul. 29, 1975, abandoned. This application Nov. 30, 1977, Ser. No. 856,055

Int. Cl.[2] C08L *61/32; C08K 3/18*

U.S. Cl. 260—29.4 R **10 Claims**

1. An aqueous, stable, low pressure resin composition comprising

(a) the resinous reaction product of melamine, formaldehyde and from about 0.07 to about 0.16%, by weight, of diethylethanolamine, having a ratio of formaldehyde to melamine of from about 1.7 to about 1.9 to 1, respectively,

(b) about 1.0% to about 4.0%, by weight, of ortho or para or mixtures of ortho and para toluene sulfonamide,

(c) from about 1.0% to about 5.0%, by weight, of ethyleneglycol phenyl ether or diglycolamine and

(d) from about 40% to about 45%, by weight, of water, the remainder being melamine/formaldehyde resin, all percentages being based on the total weight of the composition.

4,141,873

VINYLIDENE FLUORIDE POLYMER FILM-FORMING COMPOSITION IN AQUEOUS DISPERSION

Julius E. Dohany, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 254,520, May 18, 1972, abandoned. This application Nov. 27, 1974, Ser. No. 527,838

Int. Cl.[2] C08L *27/08*

U.S. Cl. 260—29.6 F **23 Claims**

1. A water-based polymer coating composition capable of forming polymer films by drying at a temperature of from ambient temperature to 550° F., consisting essentially of an admixture of aqueous dispersion of solid, high molecular weight vinylidene fluoride polymer, an aqueous dispersion of solid, high molecular weight acrylate polymer particles, and up to 10 parts by weight based on 100 parts of said polymers of a water-soluble organic solvent film-coalescing agent; wherein said composition contains, based on 100 parts by weight of water, from 10 to 180 parts by weight of vinylidene fluoride polymer and 1 to 150 parts by weight of acrylate polymer, no more than about 200 parts by weight of both polymers combined, and the acrylate polymer being from about 10% to about 75% by weight of the total weight of said polymers.

4,141,874

FLUORINE-CONTAINING ELASTOMERIC COPOLYMERS, PROCESS FOR PREPARING THE SAME AND COMPOSITION CONTAINING THE SAME

Masahiko Oka, Takatsuki; Singo Tanigawa, Ibaraki; Takesi Suzuki, Nagaokakyo; Masayasu Tomoda, Takatsuki, and Yutaka Ueta, Ibaraki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 10, 1976, Ser. No. 740,772

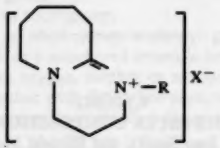
Claims priority, application Japan, Nov. 15, 1975, 50-137668; Dec. 20, 1975, 50-152123; Jan. 1, 1976, 51-350

Int. Cl.[2] C08L *27/16*

U.S. Cl. 260—29.6 F **22 Claims**

14. In a fluoroelastomer composition comprising (a) fluoroelastomer, (b) an acid acceptor selected from the group consisting of magnesium oxide, calcium oxide, lead oxide, zinc oxide, magnesium hydroxide, calcium hydroxide, lead hydroxide, zinc hydroxide, and mixtures of the above metal oxides and/or metal hydroxides with metal salts of weak acids of barium, potassium, and lead, calcium stearate, benzoate, carbonate, oxalate and phosphite, (c) an aromatic polyhydroxide contain-

ing compound selected from the group consisting of 2,2-bis(4-hydroxyphenyl)propane [Bisphenol A], 2,2-bis(4-hydroxyphenyl)perfluoropropane [Bisphenol AF], resorcinol, 1,3,5-trihydroxybenzene, 1,7-dihydroxynaphthalene, 2,7-dihydroxynaphthalene, 1,6-dihydroxynaphthalene, 4,4'-dihydroxydiphenyl, 4,4'-dihydroxystilbene, 2,6-dihydroxyanthracene, hydroquinone, catechol, 4,4'-dihydroxydiphenyl ether, 4,4'-dihydroxydiphenyl methane, 2,2-bis(4-hydroxyphenyl)butane [Bisphenol B], 4,4-bis(4-hydroxyphenyl)pentanoic acid, 2,2-bis(4-hydroxyphenyl)tetrafluorodichloropropane, 4,4'-dihydroxydiphenyl sulfone, 4,4'-dihydroxydiphenyl ketone, tri(4-hydroxyphenyl)methane, 3,3',5,5'-tetrachlorobisphenol A and 3,3',5,5'-tetrabromobisphenol A and alkali or alkaline earth metal salts of these aromatic polyhydroxy compounds, and (d) a quaternary ammonium compound having the following general formula:



wherein R is an alkyl group having from 1 to 24 carbon atoms or an aralkyl group having from 7 to 20 carbon atoms, and X^- is an anion selected from the group consisting of a halide ion, hydroxylate ion, alkoxylate ion, carboxylate ion, phenoxide ion, sulfonate ion, sulfate ion, sulfite ion and carbonate ion, the improvement which comprises employing as said fluoroelastomer an elastomeric copolymer of vinylidene fluoride and at least one other fluorine-containing monomer containing 28 to 92% by mole of the vinylidene fluoride unit and having an intrinsic viscosity of 0.4 to 1.3 at 35° C. in methyl ethyl ketone, said other fluorine-containing monomer being at least one member selected from the group consisting of tetrafluoroethylene, trifluoroethylene, trifluorochloroethylene, trifluoropropene, hexafluoropropene, pentafluoropropene, trifluorobutene, perfluoromethyl perfluorovinyl ether and perfluoroethyl perfluorovinyl ether, which copolymer is prepared by copolymerizing at a first stage vinylidene fluoride and at least one other fluorine-containing monomer in an aqueous medium in the presence of a water-soluble radical polymerization initiator to give a first stage-copolymer having an intrinsic viscosity of 0.01 to 3.0 at 35° C. in methyl ethyl ketone and further copolymerizing at a second stage vinylidene fluoride and at least one other fluorine-containing monomer in an aqueous medium in the presence of said first stage-copolymer and an oil-soluble radical polymerization initiator to give a second stage-copolymer, said elastomeric copolymer comprising 1 to 80% by weight of said first stage-copolymer and 20 to 99% by weight of said second stage-copolymer.

4,141,875

POLYCHLOROPRENE-POLYVINYL ALCOHOL LATEX

Donald F. Brizzolara, and Wolfgang Honsberg, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

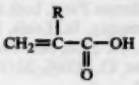
Continuation of Ser. No. 441,940, Feb. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,276, May 30, 1973, abandoned. This application Feb. 18, 1977, Ser. No. 770,057

Int. Cl.[2] C08L *11/02*

U.S. Cl. 260—29.7 E **4 Claims**

1. In a free-radical initiated process for producing an aqueous latex having high colloidal stability against coagulation upon addition thereto of ionic materials and having excellent adhesive characteristics for bonding metal films to paper to form laminates, the step comprising polymerizing at an acidic pH in an emulsion substantially free of carboxylate soaps,

(1) an aqueous suspension of chloroprene and an α,β-unsaturated carboxylic acid having the formula



where R is hydrogen, a C_1–C_4 alkyl, or the carboxymethyl group, the mole ratio of chloroprene to the α,β-unsaturated carboxylic acid being 99.6–90 to 0.4–10,

(2) in the presence of (a) about 3–10 parts of polyvinyl alcohol and (b) about 0.3–2 parts of an organic, sulfur-containing chain transfer agent of the group consisting of dialkyl xanthogen disulfides and alkyl mercaptans, both (a) and (b) being expressed in parts by weight based on 100 parts by weight of the total of monomers (1), whereby latex is obtained of a polymer which is 10–95% gel polymer and from which the polyvinyl alcohol is not completely removable by extraction with water;

with the proviso that an anionic, acid-stable, surface active agent may be present in the polymerization emulsion in an amount of 0.01–1% by weight, based on monomers.

4,141,876

ADHESIVE COMPOSITION CONTAINING A POLYPHENYLENE ETHER RESIN

David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 23, 1977, Ser. No. 836,102

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] C08L *45/00, 53/00*

U.S. Cl. 260—33.6 UA **9 Claims**

1. A hot melt adhesive composition comprising:

(a) 100 parts by weight of a block copolymer having at least two polymer end blocks A and at least one polymer mid block B, each block A being a monoalkenyl arene polymer block having an average molecular weight of between about 2,000 and about 50,000, and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight of between about 20,000 and about 300,000, said blocks A comprising 8–55% by weight of the block copolymer;

(b) about 50 to about 200 parts by weight of a tackifying resin compatible with block B;

(c) about 0 to about 200 parts by weight of a hydrocarbon extending oil; and

(d) about 1 to about 100 parts by weight of a low molecular weight polyphenylene ether resin having a molecular weight (M_{vis}) of between about 6,000 and about 25,000 and a glass transition temperature of between 170° C. and 200° C.

4,141,877

PROCESSING ORGANIC POLYMERS WITH HYDRATED GLASSES

Manfred Luttinger, Columbus, Ohio; Anthony R. Olszewski, Bath, and Donald R. Parnell, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,604

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—37 EP **8 Claims**

1. A uniformly coherent, integral body composed of hydrated alkali metal silicate glass having a water content between about 1–20% by weight and an organic polymer resistant to a hot, aqueous, alkaline environment, said body exhibiting no grain boundaries discernible by the unaided eye and essentially no signs of polymer degradation.

4,141,878

THERMOPLASTIC COMPOSITIONS OF CSM RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 14, 1978, Ser. No. 896,464
Int. Cl.[2] C08L 23/34
U.S. Cl. 260—33.6 AQ 19 Claims

1. A thermoplastic composition comprising a blend of about 15 to about 65 parts by weight thermoplastic crystalline polyolefin resin and about 85 to about 35 parts by weight crosslinked chlorosulfonated polyethylene rubber per 100 total parts by weight polyolefin resin and chlorosulfonated polyethylene rubber, in which the chlorosulfonated polyethylene rubber is cross-linked to the extent that no more than forty weight percent of the rubber is extractable in toluene.

4,141,879

THERMOPLASTIC ALLOY

Glenn G. McCarroll, 38315 Hidden Lane, Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 819,902, Jul. 28, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,325
Int. Cl.[2] C08L 77/00
U.S. Cl. 260—37 N 2 Claims

1. A thermoplastic molding compound consisting essentially of from 15%–26% of a homopolymer polyamide, from 35%–65% copolymer polyamide, 9%–18% polyurethane, from 2%–12% chopped glass fibers, from 1/2%–1.5% metallic heat stabilizers, 0.25% to 1.25% isocyanate, 0.25% to 1.25% methylene chloride, and from 1%–2% carbon black.

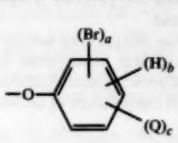
4,141,880

FLAME RETARDED NYLON COMPOSITION

Richard C. Nametz, Manchester, and Peter H. Burleigh, Ann Arbor, both of Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 3, 1978, Ser. No. 866,323
Int. Cl.[2] B60S 9/22; C08L 77/00
U.S. Cl. 260—37 N 25 Claims

1. A flame retarded, non-blooming nylon composition which is comprised of from about 5 to about 35 percent (by weight) of a polyphenylene oxide condensation product derived from brominated phenol by the displacement of bromine from said phenol wherein: (a) said phenol is selected from the group consisting of tribromophenol, tetrabromophenol, pentabromophenol, and mixtures thereof; (b) said condensation product has a repeating structural unit of the formula



wherein a is an integer of from about 0 to about 4, b is an integer of from about 0 to about 2, c is an integer of from about 1 to about 5, a plus b plus c equal 5, Q is a monovalent bond from a carbon atom in the aromatic nucleus of said repeating structural unit to an oxygen atom bonded to an aromatic nucleus, and the polymeric unit(s) containing said repeating structural unit comprise at least about 80 percent (by weight) of said product; (c) said condensation product contains from about 17 to about 31 percent (by weight) of elemental carbon, from about 0 to about 1.0 percent (by weight) of elemental hydrogen, from about 3 to about 8 percent (by weight) of elemental oxygen, and at least 60 percent (by weight) of elemental bromine; and (d) said condensation product has a molecular weight of at least 750, and one or more polymeric units containing at least four aromatic nuclei per unit comprise at least about 80 percent (by weight) of said product.

4,141,881

PROCESS FOR DYEING LINEAR POLYESTERS IN THE MELT

Fridolin Bäbler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,838
Claims priority, application Switzerland, Jul. 22, 1976, 9390/76
Int. Cl.[2] C08K 5/09, 5/15, 5/34
U.S. Cl. 260—40 P 11 Claims

1. Process for dyeing linear polyester polymers in the melt, which process comprises using as a dyeing agent a mixture consisting of 0.001–0.2% by weight, relative to the amount of polyester, of a polyester soluble perylene - 3, 4, 9, 10-tetracarboxylic acid pigment derivative, and one or more non-perylene- 3, 4, 9, 10 - tetracarboxylic acid derivative dyes which are thermostable and soluble in said linear polyester polymers.

4,141,882

POLYESTER COMPOSITIONS

Tsuneo Kodama; Isao Sasaki, and Hiroshi Mori, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1977, Ser. No. 835,707
Claims priority, application Japan, Sep. 29, 1976, 51-116763
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—40 R 12 Claims

1. A polyester composition obtained by blending, with polyester comprising at least 80% by mole of ethylene terephthalate units, (1) an epoxy compound (A) selected from the group consisting of triglycidyl isocyanurate, N-methyl-N',N''-diglycidyl isocyanurate and triglycidyl cyanurate, in an amount of from 0.0005 to 0.02 mole per 100 g of said polyester, and at least one organic compound (B) capable of reacting with the epoxy group of said epoxy compound (A), selected from those having one or more carboxyl, amino, isocyanate or hydroxyl groups, in an amount of from 0.2 to 3.0 moles per mole of said epoxy compound (A), or (2) a product of a melt reaction of said epoxy compound (A) with said organic compound (B) at a compound (B)/compound (A) mole ratio of from 0.5 to 2.0 at a temperature of from 100° to 200° C. for a period of from 5 to 30 minutes, in such an amount that said epoxy compound (A) prior to said melt reaction is in an amount of from 0.0005 to 0.02 moles per 100 g of said polyester, and then melt mixing and milling the blend.

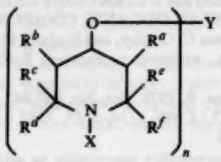
4,141,883

STABILIZATION OF SYNTHETIC POLYMERS BY PENTA-OR-HEXA-SUBSTITUTED 4-PIPERIDINOL DERIVATIVES

Nobuo Soma; Tomoyuki Kurumada, both of Hiromachi, Japan; Heimo Brunetti, Reinach, and Jean Rody, Basel, both of Switzerland, assignors to Sankyo Company, Limited, Tokyo, Japan and Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 687,793, May 19, 1976, Pat. No. 4,079,165. This application Jul. 8, 1977, Ser. No. 813,927
Claims priority, application Japan, May 28, 1975, 50-63850
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.[2] C07D 211/6; C08K 5/34
U.S. Cl. 260—45.8 N 16 Claims

1. A polymer composition stabilized against photo- and thermal- deterioration wherein there is incorporated, in an amount sufficient to prevent said deterioration, a stabilizer comprising a 4-piperidinol derivative having the formula (I)



(I)

or an acid addition salt thereof, wherein:

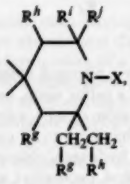
R^1 and R^b are the same or different and each represents a hydrogen atom, a lower alkyl group, an alkenyl group, an alkynyl group or an aralkyl group, provided that R^a and R^b do not simultaneously represent hydrogen atoms;

R^c and R^d are the same or different and each represents a lower alkyl group;

R^e represents an alkyl group;

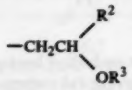
R^f represents an alkyl group, a phenyl group, an aralkyl group or a 5- or 6-membered aromatic heterocyclic group containing an oxygen, sulphur or nitrogen atom; or

R^e and R^f, together with the carbon atom to which they are attached, represent a cycloalkyl group or a group of the formula



wherein R^g and R^h are the same or different and each represents a hydrogen atom or a lower alkyl group, provided that R^h does not represent a hydrogen atom when R^g represents a lower alkyl group; R^i and R^j are the same or different and each represents a lower alkyl group; and X is as hereafter defined:

X represents a hydrogen atom, an oxyl radical, an alkyl group, an alkenyl group, an alkoxy-alkyl group, an aralkyl group, which is unsubstituted or which has one or more substituents in its aryl moiety, a 2,3-epoxypropyl group, a group of formula $—CH_2COOR^1$ wherein R^1 represents an alkyl group, an alkenyl group, a phenyl group, an aralkyl group or a cyclohexyl group; a group of formula:



wherein R^2 represents a hydrogen atom, a methyl group or a phenyl group and R^3 represents a hydrogen atom or an acyl group; an aliphatic acyl group or a group of formula $—COOR^4$ wherein R^4 represents an alkyl group, a benzyl group or a phenyl group;

n is an integer of from 1 to 4 inclusive;

when n ≈ 1:

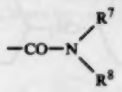
Y represents: a hydrogen atom; an aliphatic, araliphatic, alicyclic, aromatic or heterocyclic acyl group;

a group of formula $—CO.R^5.COOH$ wherein R^5 represents an alkylene group, whose chain may optionally be interrupted by a sulphur atom, or a phenylene group, or a metal salt or a lower alkyl ester thereof;

a monovalent group obtained by removing a hydroxy group from a sulphur-containing acid;

a monovalent group obtained by removing a hydroxy group from a phosphorus-containing acid;

a group of formula



wherein R^7 represents a hydrogen atom, a lower alkyl group, an aralkyl group or a phenyl group; and R^8 represents an alkyl group, a substituted or unsubstituted aryl group, an aralkyl group or a cyclohexyl group; or R^7 and R^8, together with the nitrogen atom to which they are attached, represent a piperidino group, a 1-pyrrolidinyl group or a morpholino group;

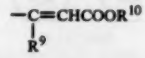
an alkyl group;

an alkenyl group;

an aralkyl group, which is unsubstituted or has one or more substituents in its aryl moiety;

a cyclohexyl group; or

a group having the formula:



in which R^9 represents a hydrogen atom, a methyl group or a phenyl group and R^{10} represents an alkyl group;

when n = 2:

Y represents an aliphatic, araliphatic, aromatic, alicyclic or heterocyclic diacyl group;

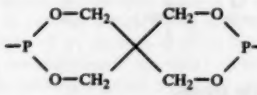
a carbonyl group;

a sulphinyl group;

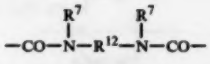
a sulphonyl group;

a group obtained by removing two hydroxy groups from a phosphorus-containing acid;

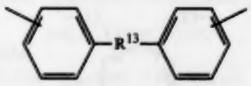
a group of formula



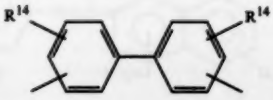
a group of formula



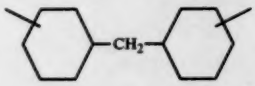
in which R^7 is as defined above and R^{12} represents an alkylene group, an arylene group, which is unsubstituted or has one or more methyl substituents, a xylylene group, a cyclohexylene group, a group of formula



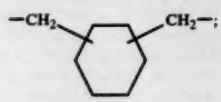
(in which R^{13} represents an oxygen atom or a methylene group); a group of formula



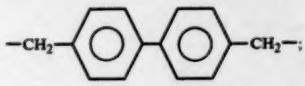
(in which R^{14} represents a hydrogen atom or a methyl group); a group of formula



or a group of formula

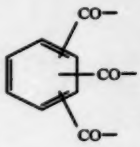


an alkylene group;
an alkenylene group;
a xylylene group or a group of the formula

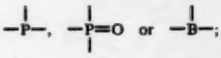


when n = 3:

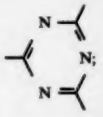
Y represents: a group having the formula



a group of formula

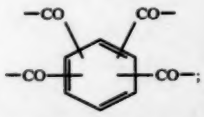


or a group of the formula



when n = 4:

Y represents: a group of the formula



or a group of the formula

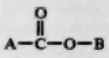
4,141,884

HETEROCYCLIC ESTER ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

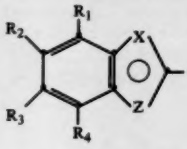
Gether Irick, Jr.; James C. Ownby, and Richard H. S. Wang, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,847
Int. Cl.[2] C08K *5/34, 5/35, 5/47*
U.S. Cl. 260—45.8 N **16 Claims**

16. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one piperidinyl ester of heterocyclic carboxylic acids having the formula:



wherein A is a group having the structure



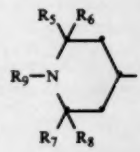
wherein

X is a carbon atom or a nitrogen atom;

Z is an oxygen atom, a sulfur atom, or a nirogen atom containing a hydrogen atom or an unsubstituted or substituted lower alkyl group having 1 to 12 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy. substituted amino, cyano, and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4 combined with the carbon atoms to which they are attached are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

B is a group having the formula



wherein R_5 and R_6 are each alkyl having 1–6 carbons; R_7 and R_8 are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R_9 is hydrogen, oxyl, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl.

4,141,885

BIS UREIDE OF A POLYOXYALKYLENE POLYAMINE AS AN EPOXY ADDITIVE

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

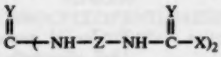
Filed Jun. 30, 1977, Ser. No. 811,802
Int. Cl.[2] C08G *59/48*
U.S. Cl. 528—93 **7 Claims**

1. An epoxy resin composition produced from a curable admixture which comprises:

a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;

an effective amount of a substituted bicyclic vicinal anhydride curing agent;

an amount of a thermal shock resistance improving additive consisting essentially of a bis ureide of a polyoxalkylene polyamine, said additive having an average molecular weight of at least 4,000, and having a formula:



wherein X is a primary amino group; Y is oxygen or sulfur and Z is a polyoxyalkylene group.

4,141,886

ESSENTIALLY LINEAR POLYMER HAVING A PLURALITY OF AMIDE, IMIDE, AND ESTER GROUPS THEREIN AND A METHOD OF MAKING THE SAME

George H. Sollner, Fort Wayne; Keith D. Bultemeier, Decatur, and Richard D. Remaks, Fort Wayne, all of Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,442

Int. Cl.[2] C08G *73/10, 73/16*

U.S. Cl. 528—273 **15 Claims**

1. An essentially linear resin having a plurality of amide, imide and ester groups therein and the physical mechanical, chemical and electrical properties of a magnet wire insulation material comprising the condensation product of at least one polycarboxylic acid five member ring forming reactant, at least one ethylenically unsaturated polycarboxylic acid five or six member lactam ring forming reactant, at least one polyfunctional amino five or six member ring forming reactant, at least one glycol, at least one other polyfunctional hydroxyl compound, at least one carboxylic acid ester reactant chosen from the group consisting of the acids, esters, anhydrides, and akylesters of terephthalic, isophthalic and benzophenone dicarboxylic acids, the molar ratio of the functional hydroxyl groups of said glycol and hydroxyl compound to the functional ester-forming carboxyl groups of said acid reactants being greater than about 1.3 to 1, the molar ratio of the functional imide-forming groups of said polycarboxylic acid five member ring forming reactant and said polyfunctional amino reactants to the functional lactam-forming groups of said ethylenically unsaturated acid and polyfunctional amino reactants being greater than about 0.5 to 1 and less than about 3.0 to 1, the molar ratio of said ester-forming groups to said functional imide-forming and lactam-forming groups being greater than about 1.0 to 1 and less than about 3.0 to 1.

4,141,887

PROCESS AND APPARATUS FOR THE PRODUCTION OF STERILE FILTERED BLOOD CLOTTING FACTORS

Arnold Seufert, Zehnstrasse 3, 8702 Hettstadt, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,776

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624373

Int. Cl.[2] A23J *1/06*; C07G *7/026*

U.S. Cl. 260—112 B **10 Claims**

1. A process for the manufacture of sterile filtered blood-clotting products concentrated in Factor VIII comprising the steps of:

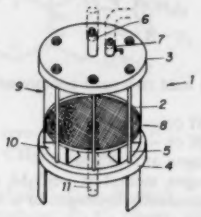
extracting blood from a number of at least one donor; said number being sufficiently low to reduce the risk of virus-hepatitus infection to about 0.3%;

physically separating the blood to obtain substantially purified plasma, free of cellular components, said separating step being carried out in a sequence of at least two centrifuging steps, to obtain plasma with an increasing degree of purity;

deep freezing the purified plasma at a temperature below about minus 22° C., to preserve Factor VIII;

thawing the plasma to produce a cryo-precipitate;

enriching and physically separating the cryo-precipitate from the thawed plasma by centrifuging;



dissolve the cryo-precipitate in a buffer; and

effecting a sterile filtration of the buffer-dissolved, cryo-precipitate by means of a static filtration device at a pressure of less than 0.5 atm.

4,141,888

PROCESS FOR PRODUCING REDUCED KERATINOUS SUBSTANCES USING UREA OR THIOUREA

Hisayuki Matsuda, Nagaokakyo; Minoru Takahashi, Uji; Katsuro Shinoda, Suita; Sho Kikyotani, Osaka, and Hiroshi Inagaki, Nagaokakyo, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1978, Ser. No. 883,997

Claims priority, application Japan, Mar. 7, 1977, 52-24999

Int. Cl.[2] C08H *1/06*

U.S. Cl. 260—123.7 **12 Claims**

1. A heavy metal ion capturing agent comprising a reduced keratinous substance having a high adsorptive power for cationic substances; said reduced keratinous substance being produced by reducing a substance containing keratin as a main ingredient under an alkaline condition of a pH of about 8 to about 11 to cleave the disulfide linkages of the keratin, dissolving 1 to 10 parts by weight of the reduced keratin in 100 parts by weight of an aqueous medium containing urea or thiourea in a concentration of less than 5 moles/liter, and then acidifying the resulting solution to a pH of about 4 to about 6 to precipitate the reduced keratinous substance in the form of powders, granules or flakes having a surface area of 0.1 to 200 m^2/g, all the foregoing process steps being carried out in an atmosphere is an inert gas.

4,141,889

SYMMETRICAL HEXAKISAZO COMPOUNDS HAVING A 2,2'-DISULFOSTILBENYL CENTRAL RADICAL

Zdenek Allan, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

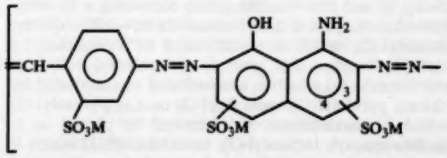
Filed Jul. 27, 1977, Ser. No. 819,241

Claims priority, application Switzerland, Aug. 2, 1976, 9832/76

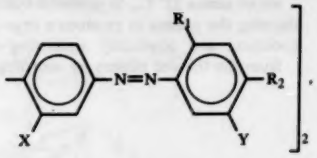
Int. Cl.[2] C09B *35/36*

U.S. Cl. 260—144 **27 Claims**

1. A symmetrical compound of the formula



-continued



or a mixture of at least two such compounds,
wherein
each R_1 is —OH or $—NH_2$,
each R_2 is —OH or $—NH_2$,
each X is hydrogen or $—SO_3M$,
each Y is hydrogen, methyl or $—SO_3M$, and
each M is independently hydrogen or a non-chromophoric cation.

4,141,890
AZO COMPOUNDS HAVING A 3-SULPHOMETHYL-PYRAZOLONE-(5) COUPLER COMPONENT

Gert Hegar, Schönenbuch, Switzerland, and Gerhard Back, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 606,919, Aug. 22, 1975, abandoned, which is a continuation of Ser. No. 396,258, Sep. 11, 1973, abandoned. This application Oct. 29, 1976, Ser. No. 737,243
Claims priority, application Switzerland, Oct. 5, 1972, 14560/72
Int. Cl.[2] C09B *29/38, 31/14, 43/12, 62/08*
U.S. Cl. 260—153 **3 Claims**

1. An azo dyestuff of the formula

wherein
D is phenyl or phenyl substituted by chloro, bromo, methyl, nitro, cyano, trifluoromethyl, carbomethoxy, carboethoxy, cyclohexylcarbonyloxy, N-methylsulfonamido, N,N-dimethylsulfonamido, N,N-diethylsulfonamido, N,γ-isopropyloxypropylsulfonamido, N-isopropylsulfonamido, N,γ-methoxypropylsulfonamido, N,N-bis(β-hydroxyethyl)sulfonamido, sulfonamido, phenylazo, methoxyphenylazo, tolylazo, chlorophenylazo, dichlorophenylazo, sulfonamidophenylazo, acetylamino, hydroxy, acetyl, carboxamido, methylsulfonyl, sulfo, N-(β-hydroxyethyl)sulfonamido, ethylsulfonyl, β-hydroxyethylsulfonyl, carboxy, benzoylamino, disulfophenylazo, disulfonapthylazo, sulfophenylazo, (carboxy, sulfo) phenylazo, β-sulfatoethylsulfonyl, β-sulfoethylsulfonylmethylamido, or a fiber reactive group containing a halo substituted six-membered heterocyclic radical with two or three ring nitrogen atoms and capable of reacting with the hydroxyl groups of cellulose or the amino groups of polyamides to form a covalent bond therewith, and bonded via an —NH— group; napthyl or napthyl substituted by N,γ-isopropyloxypropylsulfonamido, carboxy, hydroxy, sulfo, sulfonamido, nitro, acetylamino, disulfophenylazo, methoxy, or said fiber-reactive group containing a six-membered heterocyclic radical bonded via an —NH— group; thiazolyl-(2) which is unsubstituted or substituted by methylsulfonyl methyl, phenyl, or 4-chlorophenyl; benzisothiazolyl-(3) which is unsubstituted or substituted by chloro; pyridinyl-(3); quinolinyl-(3) or -(2); pyrazolyl-(3) which is unsubstituted or substituted by phenyl or 4-methoxyphenyl; indazolyl-(3); benzthiazolyl-(2) which is unsubstituted or substituted by methyl, methoxy or chloro; 1,2,4-triazolyl-(3) which is unsubstituted or substituted by methyl, ethyl, phenyl or benzyl; 1,3,4-thiadiazolyl-(2); or 1,3,5-thiadiazolyl-(2) which is unsubstituted or substituted by phenyl or methyl; and
R is hydrogen; alkyl of 1 to 4 carbon atoms; hydroxyethyl; cyanoethyl; methoxyethyl; cyclohexyl; benzyl; disulfonaphthyl; or phenyl which is unsubstituted or substituted by methyl, methoxy, chloro, bromo, fluoro, nitro, sulfo, NH_2—, acetylamino or a group of the formula

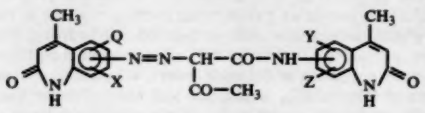
wherein
R' is hydrogen, alkyl of 1 to 4 carbon atoms or hydroxyethyl, and
Z is said fiber reactive group containing a six-membered heterocyclic radical.

4,141,891
QUINOLONE-AZO-ACETOACETAMINO QUINOLONE PIGMENTS

Rudolf Mory, Dornach, and Rolf Müller, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 550,310, Feb. 18, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 815,897
Claims priority, application Switzerland, Feb. 28, 1974, 2830/74
Int. Cl.[2] C09B *29/32, 29/36*
U.S. Cl. 260—155 **8 Claims**

1. An azo pigment of the formula



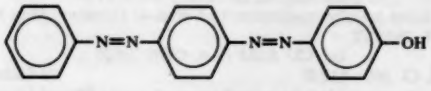
wherein Q, X, Y and Z independently represent hydrogen; halo; alkyl of 1–4 carbon atoms; alkoxy of 1–4 carbon atoms; aryl; aryl substituted by halo, alkyl of 1–4 carbon atoms, or alkoxy of 1–4 carbon atoms; aryloxy; or aryloxy substituted by halo, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms.

4,141,892
PROCESS FOR PREPARING p-[[p-(PHENYLAZO)PHENYL]AZO]PHENOL

Edgar E. Renfrew, Flemington, and Roy E. Smith, Mill Hall, both of Pa., assignors to American Color & Chemical Corporation, Charlotte, N.C.

Filed Aug. 4, 1977, Ser. No. 821,950
Int. Cl.[2] C09B *31/06*
U.S. Cl. 260—186 **1 Claim**

1. In a method for preparing the compound:



wherein aniline is diazotized in aqueous hydrochloric acid employing sodium nitrite as the diazotizing agent to form benzenediazonium chloride, the benzenediazonium chloride is coupled into aniline to form aminoazobenzene, and the aminoazobenzene is diazotized and coupled into phenol; the improvement comprising: diazotizing the aniline employing an excess of sodium nitrite of up to about 10% of the amount stoichiometrically required to diazotize one-half of the aniline on a molar basis; coupling the resultant benzenediazonium chloride with the remaining aniline to form a mixture of

aminoazobenzene and excess benzenediazonium chloride in aqueous hydrochloric acid; heating said mixture to about 40° C. and allowing said excess benzenediazonium chloride to decompose and, subsequently, without isolation, diazotizing said aminoazobenzene and coupling it into phenol.

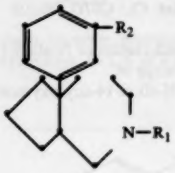
4,141,893

DECAHYDROCYCLOPENT[c]AZEPINES

Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

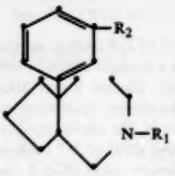
Filed Nov. 2, 1976, Ser. No. 737,957
Int. Cl.[2] C07D *223/32*; A61K *31/55*
U.S. Cl. 260—239 BB **20 Claims**

1. A compound of the formula:

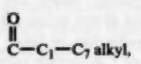


wherein:
R_1 is C_1–C_8 alkyl, CH_2R_3, benzyl, or 2-phenethyl,
in which:
R_3 is C_2–C_7 alkenyl or C_3–C_6 cycloalkyl;
R_2 is hydrogen, hydroxy, or C_1–C_3 alkoxy; and the pharmaceutically acceptable acid addition salts thereof.

17. A compound of the formula



wherein:
R_1 is



benzoyl, phenylacetyl, or

in which:
R_3 is C_2–C_7 alkenyl or C_3–C_6 cycloalkyl; and
R_2 is hydrogen, hydroxy or C_1–C_3 alkoxy.

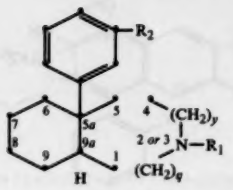
4,141,894

TRANS-5A-ARYL-DECAHYDROBENZAZEPINES

Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

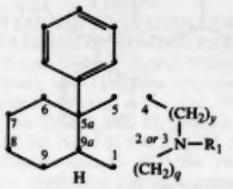
Filed Nov. 2, 1976, Ser. No. 737,959
Int. Cl.[2] C07D *223/16*
U.S. Cl. 260—239 BB **27 Claims**

1. A compound of the formula

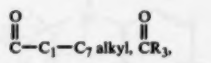


wherein:
one of y and q is zero and the other is 1;
R_1 is C_1-C_8 alkyl, CH_2R_3 or benzyl
wherein:
R_3 is C_2-C_7 alkenyl or C_3-C_6 cycloalkyl,
R_2 is hydrogen, hydroxy, C_1-C_3 alkoxy; and the non-toxic pharmaceutically acceptable acid addition salts thereof.

21. A compound of the formula

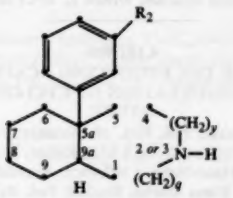


wherein:
one of y or q is zero and the other is 1;
R_1 is



or benzoyl;
wherein:
R_3 is C_2-C_7 alkenyl, or C_3-C_6 cycloalkyl;and
R_2 is hydrogen, hydroxy, or C_1-C_3 alkoxy.

26. A compound of the formula



wherein:
one of y or q is zero and the other is 1; R_2 is hydrogen, hydroxy or C_1-C_3 alkoxy.

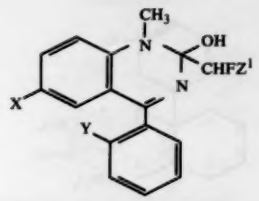
4,141,895

HYDROXYQUINAZOLINES AND THEIR USE AS INTERMEDIATES FOR PHARMACEUTICAL AGENTS

William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

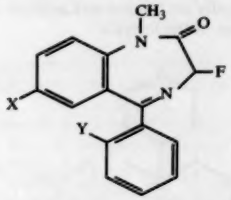
Filed Jun. 16, 1977, Ser. No. 807,077
Int. Cl.[2] C07D *243/34, 243/28, 239/80*
U.S. Cl. 260—239.3 D **9 Claims**

1. A compound of the formula:

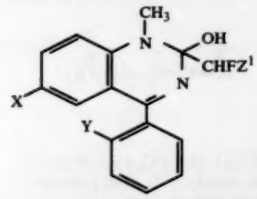


where
X is Cl, Br, NO_2, or CF_3;
Y is H, Br, Cl or F; and
Z^1 is Cl or Br.

7. A process for preparing a compound of the formula:



where
X is Cl, Br, NO_2 or CF_3; and
Y is H, Br, Cl or F;
which comprises reacting a compound of the formula:



with an alkali metal hydride, where Z^1 is Cl or Br.

4,141,896

PROCESS FOR THE PRODUCING ε-CAPROLACTAM FROM THE DISTILLATION OF CYCLOHEXANONE OXIME

Otto Immel, Krefeld, Fed. Rep. of Germany; André de Jager, Brasschaat, Belgium; Bernd-Ulrich Kaiser, Krefeld, Fed. Rep. of Germany; Hans-Helmut Schwarz, Krefeld, Fed. Rep. of Germany, and Klaus Starke, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 832,008

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641381

Int. Cl.[2] C07D *201/04*

U.S. Cl. 260—239.3 A **2 Claims**

1. A process for utilizing the dark brown to black residue which is obtained in the distillation recovery of pure cyclohexanone oxime which comprises introducing cyclohexanone oxime in the gaseous phase into a reaction zone in the presence of an inert gas and a boron oxide containing catalyst under conditions which rearrange said oxime and produce ε-caprolactam while simultaneously introducing said residue in liquid form into said rearrangement reaction zone, said reaction being carried out with a quantity of cyclohexanone oxime introduced in gaseous form which is 5 to 500 times the quantity of introduced liquid residue and with a quantity of inert gas which is at least 50 times the quantity of introduced liquid residue.

4,141,897

N-DEALKYLATION OF N-ALKYL-14-HYDROXYMORPHINANS AND DERIVATIVES THEREOF

Roy A. Olofson, State College, Pa., and Joseph P. Pepe, Rochester, N.Y., assignors to Research Corporation, New York, N.Y.

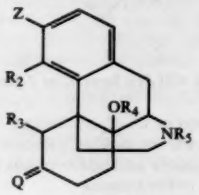
Filed Dec. 20, 1976, Ser. No. 751,570

Int. Cl.[2] C07D *489/08*

U.S. Cl. 546—45 **14 Claims**

1. Process of N-dealkylation of N-alkyl-14-hydroxymorphinans comprising the steps of

(a) reacting an N-alkyl-14-acyloxymorphinan of the formula



where Z is R_1O
where
R_1 is lower alkanoyl of 1–6 carbon atoms wherein the alkyl moiety thereof is a straight chain or branch chain alkyl of 1–5 carbon atoms, phenyl lower alkanoyl wherein the alkyl moiety is as above, or cycloalkyl carbonyl having 3–6 carbon atoms in the cyclic moiety, straight chain or branch chain lower alkyl of 1–5 carbon atoms, cycloalkyl and cycloalkyl lower alkyl of 3–5 carbon atoms in the cyclic moiety and 1–5 carbon atoms in the lower alkyl moiety, phenyl lower alkyl and substituted phenyl lower alkyl wherein the lower alkyl is 1–5 carbon atoms and the substituents on the phenyl moiety are lower alkyl or lower alkoxy of 1–5 carbon atoms in the alkyl or alkoxy moiety,
R_2 and R_3 are each hydrogen or taken together are oxa,
R_4 is lower alkanoyl of 1–6 carbon atoms wherein the alkyl moiety thereof is straight or branch chain alkyl of 1–5 carbon atoms, or cycloalkylcarbonyl of 3–6 carbon atoms in the cyclic moiety, phenyl carbonyl, or substituted phenylcarbonyl, phenyl loweralkanoyl or substituted phenyl loweralkanoyl, wherein the alkanoyl moiety contains 1–6 carbon atoms, and the substituents on the phenyl moiety are loweralkyl or loweralkoxy of 1–5 carbon atoms,
R_5 is lower alkyl of 1–6 carbon atoms, phenyl lower alkyl having 1–6 carbon atoms in the lower alkyl moiety, cycloalkyl or cycloalkyl lower alkyl of 3–6 carbon atoms in the cyclic moiety and 1–5 carbon atoms in the lower alkyl moiety,
Q is two hydrogen atoms or oxo, With a source of the group Y—O—CO.— wherein Y is vinyl, 2-haloethyl, 2,2-dihaloethyl or 2,2,2-trihaloethyl to form the corresponding Y-oxycarbonylamide;

(b) cleaving said Y-oxycarbonylamide under acidic conditions to split off said Y-oxycarbonyl group from the amino-N atom to obtain the corresponding secondary amine acid salt.

4,141,898
IMIDAZO PYRIDINIUM QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS

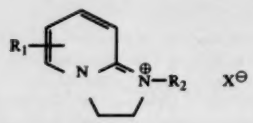
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, which is a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,400

Int. Cl.[2] C07D *487/04*

U.S. Cl. 546—121 **3 Claims**

1. A compound selected from the group consisting of:



wherein R_1 is hydrogen, chlorine, methoxy or benzyloxy; R_2 is furfuryl or 8quinolylmethyl; and X is a pharmaceutically acceptable anion.

4,141,899
4,5,6,7-TETRAHYDROIMIDAZO-[4,5-c]-PYRIDINE DERIVATIVES

Giuliana Arcari; Luigi Bernardi; Giovanni Falconi; Fulvio Luini; Giorgio Palamidessi, and Ugo Scarponi, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

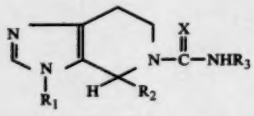
Continuation-in-part of Ser. No. 756,290, Jan. 3, 1977, abandoned. This application Oct. 3, 1977, Ser. No. 838,844

Claims priority, application United Kingdom, Jan. 7, 1976, 00573/76; Jun. 29, 1976, 27071/76

Int. Cl.[2] C07D *471/04*

U.S. Cl. 546—118 **38 Claims**

1. A compound of the formula I:



I

where

R_1 is hydrogen or an alkyl having from 1 to 4 carbon atoms;

R_2 is hydrogen, an alkyl having from 1 to 4 carbon atoms, a cycloalkyl having from 3 to 6 carbon atoms or phenyl;

R_3 is hydrogen, a saturated or unsaturated straight or branched alkyl having from 1 to 6 carbon atoms, a cycloalkyl having from 3 to 6 carbon atoms, benzoyl or phenyl; and

X is O or S;

or a pharmaceutically acceptable acid addition salt thereof.

4,141,900
3-PHENYL-7-(V-TRIAZOL-2-YL)-COUMARINS

Hans Schläpfer, deceased, late of Basel, Switzerland (by Nelly Schläpfer, heiress; by Alex R. Schläpfer, heir assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

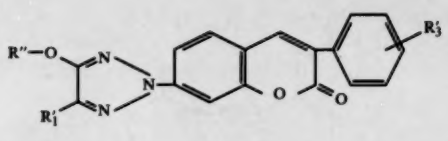
Filed Mar. 16, 1977, Ser. No. 777,995

Claims priority, application Switzerland, Mar. 26, 1976, 3813/76

Int. Cl.[2] C07D *405/04, 413/04*; C09K *1/02*

U.S. Cl. 260—308 A **2 Claims**

1. 3-Phenyl-7-(v-triazol-2-yl)-coumarins of the formula



wherein

R'' represents an alkyl group of 1 to 4 carbon atoms, an allyl or benzyl group,

R_1' represents a hydrogen or chlorine atom, and

R_3' represents a hydrogen atom, a chlorine atom, an alkyl or alkoxy group of 1 to 4 carbon atoms.

4,141,901
PROCESS FOR PRODUCING TRIAZOLYLBENZOPHENONE DERIVATIVES

Kentato Hirai, Kyoto; Toshio Fujishita, Nishinomiya; Teruyuki Ishiba, Takatsuki, and Hiroshiko Sugimoto, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

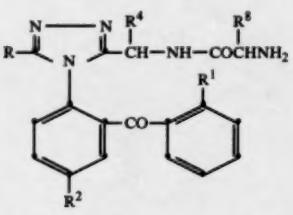
Division of Ser. No. 722,670, Sep. 13, 1976, abandoned, which is a continuation of Ser. No. 718,934, Aug. 30, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 861,010

Claims priority, application United Kingdom, Dec. 30, 1975, 53224/75

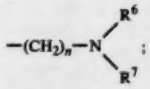
Int. Cl.[2] C07D *249/14*

U.S. Cl. 260—308 R **1 Claim**

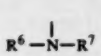
1. A process for preparing a compound of the formula:



wherein R represents hydrogen, C_1–C_6 alkyl, C_1–C_6 chloroalkyl, C_1–C_6 bromo-alkyl, C_1–C_6 fluoro-alkyl, C_1–C_6 iodoalkyl, the group $-(CH_2)_n-X-R^5$, or the group

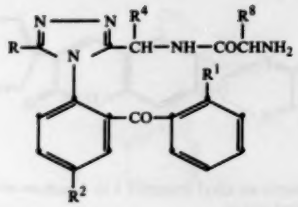


R^5 represents hydrogen, C_1–C_6 alkyl, vinyl, allyl, butenyl, pentenyl, hexenyl, ethynyl, propynyl, butynyl, pentynyl, phenyl, tolyl, xylyl, pyridyl, formyl, acetyl, propionyl, benzoyl, carbobenzoxy, glycyl, alanyl, leucyl or phenylalanyl; X represents sulfur or oxygen; n represents zero, 1, 2, or 3; R^6 and R^7 each represents hydrogen or C_1–C_6 alkyl; or the group



represents pyrrolidino; R^1 represents hydrogen or halogen; R^2 represents halogen, nitro, or trifluoromethyl; R^4 and R^8 each represents hydrogen, C_1–C_6 alkyl, or C_7–C_{10} aralkyl,

which comprises reducing an azido derivative of the formula:



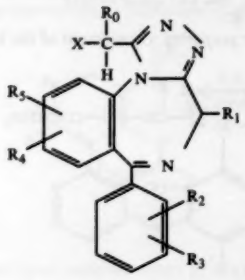
wherein R, R^1, R^2, R^4 and R^8 each is as defined above with a reducing agent in an inert solvent, said reducing agent being (1) a mixture containing stannous chloride and sodium hydroxide or (2) zinc dust.

4,141,902
1-HALOMETHYL-6-PHENYL-4H-s-[4,3-a][1,4]BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 28, 1971, Ser. No. 138,288
Int. Cl.[2] C07D *487/04;* A61K *31/55*
U.S. Cl. 260—308 R 5 Claims

1. A 1-substituted-6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine of the formula II:



II

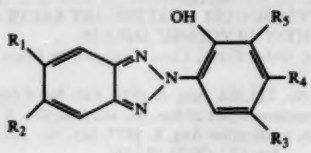
wherein R_0 is selected from the group consisting of hydrogen, methyl, ethyl, fluorine, chlorine, and bromine; wherein X is fluorine, bromine, or chlorine; wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl as defined above, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, and alkylsulfonyl, in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive and the pharmaceutically acceptable acid addition salts thereof.

4,141,903
PROCESS FOR THE PRODUCTION OF 2-ARYL-2H-BENZOTRIAZOLES

Arnold S. Adler, Greenville, R.I., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,358
Int. Cl.[2] C07D *249/20*
U.S. Cl. 260—308 B 21 Claims

1. A process for the production of 2-aryl-2H-benzotriazoles of the formula I.



I

wherein

R_1 is hydrogen or chlorine,

R_2 is hydrogen, chlorine, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or carboalkoxy of 2 to 9 carbon atoms, carboxy or $-SO_3H$,

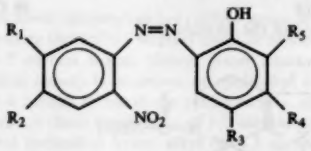
R_3 is alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenyl substituted with alkyl groups, said alkyl groups having 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, chlorine, carboxyethyl or phenylalkyl of 7 to 9 carbon atoms,

R_4 is hydrogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, chlorine or hydroxyl, and

R_5 is hydrogen, alkyl of 1 to 12 carbon atoms, chlorine, cycloalkyl of 5 to 6 carbon atoms or phenylalkyl of 7 to 9 carbon atoms,

which comprises

reducing and cyclizing the corresponding o-nitroazobenzene intermediate (II)



(II)

with carbon monoxide at a temperature in the range of from about 20° C to about 150° C and at a pressure in the range of from about 15 psia (1.05 kg/cm^2,1 atmosphere) to about 1000 psia (70 kg/cm^2,66 atmospheres) when mixed in an alkaline medium having a pH greater that 10 in the presence of at least 0.05 mol, per mol of said o-nitroazobenzene intermediate, of a copper compound-amine complex catalyst consisting essentially of

(a) a copper compound selected from the group consisting of copper oxide, copper hydroxide, copper carbonate and a copper salt of a weak organic acid, and

(b) an amine of the formula

$$R^6—NH—R^7$$

wherein R^6 is hydrogen; or when R^7 is alkyl of 1 to 6 carbon atoms, R^6 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, β-hydroxyethyl, $—(CH_2)_nNH_2$ where n is 4 to 6, or $—(C_xH_{2x}NH)_y(C_xH_{2x})NH_2$ where x is 2 or 3 and y is 0 to 3; or R^6 and R^7 together are alkylene of 4 to 5 carbon atoms, said complex containing at least two mols of said amine per mol of said copper compound, and

recovering the desired 2-aryl-2H-benzotriazole.

4,141,904

PROCESS FOR THE PREPARATION OF PHTHALOCYANINE PIGMENTS

Louis A. Cabut, Creil; Jean-Claude H. R. Hardouin, Chantilly; Michel E. A. Huille, Creil, and Daniel Pigasse, Chantilly, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation-in-part of Ser. No. 561,389, Mar. 24, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 776,012
Claims priority, application France, Mar. 24, 1975, 74 10056
Int. Cl.[2] C09B *47/04*
U.S. Cl. 260—314.5 14 Claims

1. Improved process for the preparation of copper phthalocyanine pigment stable to crystallization by grinding a crude copper phthalocyanine and adding a compound stabilizing the pigment against crystallization and derived from phthalocyanine, wherein the improvement comprises in a first step dry grinding the crude phthalocyanine in the absence of any mineral substrate and of any crystallizing solvent thereby obtaining a ground phthalocyanine of non-pigmentary or feebly pigmentary character, and in a second step treating the said ground phthalocyanine with a crystallizing solvent in the presence of the stabilizing compound at a temperature from ordinary room temperature to the boiling temperature of the solvent, the concentration of the stabilizing compound being from 1% to 25% of the weight of the phthalocyanine.

4,141,905

N-(2-METHYL-1-NAPHTHYL)-MALEIMIDE

Frank C. Becker, Gurnee, and Jorge P. Li, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 19, 1977, Ser. No. 843,610
Int. Cl.[2] C07D *207/40*
U.S. Cl. 260—326.5 FM 1 Claim

1. N-(2-methyl-1-naphthyl)maleimide.

4,141,906

SMOKING COMPOSITION AND COMPOUNDS THEREFOR

Lina C. Teng, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 659,691, Feb. 20, 1976, Pat. No. 4,036,237. This application May 3, 1977, Ser. No. 793,400
Int. Cl.[2] C07D *317/44*
U.S. Cl. 260—340.5 R 2 Claims

1. The compound ethyl 2,2-dimethyl-3-hydroxy-3-(3',4'-methylenedioxyphenyl)-propionate.

2. The compound 2,2-dimethyl-3-hydroxy-3-(3',4'-methylenedioxy phenyl) propionic acid.

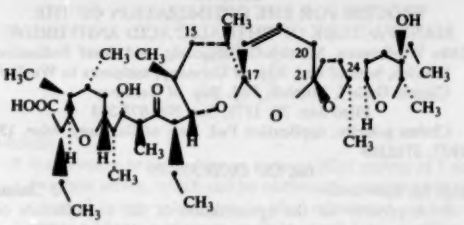
4,141,907

DEOXYNARASIN ANTIBIOTICS

Walter M. Nakatsukasa; Gary G. Marconi; Norbert Neuss, all of Indianapolis, and Robert L. Hamill, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

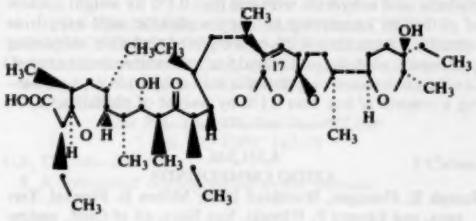
Filed Oct. 20, 1977, Ser. No. 844,087
Int. Cl.[2] C07D *309/22*; A61K *31/35*
U.S. Cl. 260—345.7 R 5 Claims

1. 20-Deoxynarasin which has the following formula:



and its pharmaceutically acceptable salts.

3. 20-Deoxy-epi-17-narasin which has the following formula:



and its pharmaceutically acceptable salts.

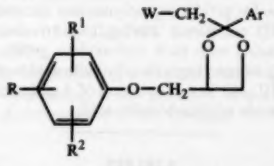
4,141,908

2-ARYL-1,3-DIOXOLANES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 732,827, Oct. 15, 1976, Pat. No. 4,101,665, which is a continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Jun. 2, 1977, Ser. No. 802,700
Int. Cl.[2] C07D *317/10*
U.S. Cl. 260—340.9 R 2 Claims

1. A chemical compound having the formula



wherein:

W is a member selected from the group consisting of halo, 4-methylphenylsulfonyloxy and methylsulfonyloxy;

Ar is a member selected from the group consisting of phenyl, substituted phenyl, and naphthyl, wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano;

R is a member selected from the group consisting of nitro, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl; and

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and lower alkyloxy.

4,141,909

PROCESS FOR THE OPTIMIZATION OF THE MANUFACTURE OF PHTHALIC ACID ANHYDRIDE

Otto Wiedemann, Munich-Geiselgasteig, and Josef Sedlmeier, Munich, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,393

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711289

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.4 3 Claims

1. A process for the optimization of the manufacture of phthalic acid anhydride comprising the steps of subjecting o-xylene to a gas phase oxidation over catalysts containing vanadium oxide and titanium oxide at temperatures of from 300° C. to 500° C., wherein said temperature is at least 5° C. to 20° C. below the optimum temperatute for conversion to phthalic acid anhydride with less than 0.1% by weight content of phthalide, recovering an impure phthalic acid anhydride containing more than 0.1% by weight of phthalide, subjecting said impure phthalic acid anhydride to countercurrent crystallization, and recovering phthalic acid anhydride crystals having a content of less than 0.1% by weight of phthalide.

4,141,910

AZIDO COMPOUNDS

Joseph E. Flanagan, Woodland Hills; Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 768,292, Feb. 14, 1977, abandoned. This application Aug. 15, 1977, Ser. No. 824,376

Int. Cl.[2] C07C *117/00*

U.S. Cl. 260—349 3 Claims

1. An organic aliphatic ether compound containing both fluorodinitro and azido moieties having the strucutre of $FC(NO_2)_2—CH_2—O—CH_2—R_1$ wherein R_1 is $—CH_2N_3$ and $—O—CH—(CH_2N_3)_2$.

4,141,911

PRODUCTION OF POLYNUCLEAR DICARBOXYLATOTETRACHROMIUM (III) COMPLEXES

Shoichi Matsumoto; Daisuke Nakagawa, and Nagao Kaneko, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 26, 1977, Ser. No. 790,901

Claims priority, application Japan, May 28, 1976, 51-62036

Int. Cl.[2] C07F *11/00*

U.S. Cl. 260—438.5 R 37 Claims

1. A process for producing polynuclear dicarboxylatotetrachromium (III) complexes having two trivalent chromium atoms coordinated with each carboxylato group, which consists essentially of reacting a dicarboxylic acid with a monobasic chromic (III) salt in a proportion of 4 moles of basic chromic salt to 1 mole of dicarboxylic acid.

4,141,912

PROCESS FOR THE PREPARATION OF POLYHALOBENZYLIC DISULFOOXONIUM COMPOUNDS

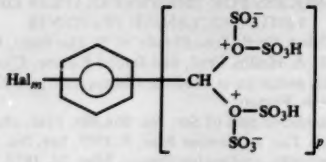
Victor Mark, Evansville, Ind., and Leon R. Zengierski, North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 607,326, Aug. 25, 1975, Pat. No. 4,075,238, which is a continuation of Ser. No. 410,723, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 123,014, Mar. 10, 1971, abandoned. This application Oct. 7, 1977, Ser. No. 840,935

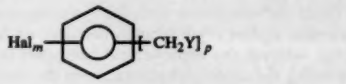
Int. Cl.[2] C07C *141/16*

U.S. Cl. 260—458 C 4 Claims

1. A process for the preparation of a compound of the formula



which comprises reacting an excess of neat, liquid sulfur trioxide with a compound of the formula



Hal is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine;

Y is hydrogen or hydroxyl;

m is 4 or 5

p is 6-m.

4,141,913

METHOD OF GENERATING LOWER ALKYL AND CYCLOALKYL ISOCYANATES

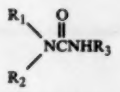
Sanford Schwartzman, Tenafly, and Daniel A. Lima, Bloomsbury, both of N.J., assignors to American Carbonyl, Inc., Englewood, N.J.

Filed Jan. 23, 1978, Ser. No. 871,491

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P 7 Claims

1. A method of generating lower alkyl and cycloalkyl isocyanates in situ consisting essentially of pyrolyzing, in the absence of solvent an appropriately selected aryl urea of the formula



wherein R_1 is aryl, R_2 may be either alkyl, cycloalkyl or aryl, and in which R_3 is the specific lower (C_1 through C_6) alkyl or cycloalkyl radical of the isocyanate selected to be generated, said urea being characterized by selection of the

moiety so that only the R_3NCO moiety of said urea is vaporized at the pyrolysis temperature.

4,141,914

NOVEL 11-DEOXY-11-SUBSTITUTED PROSTAGLANDINS OF THE E AND F SERIES

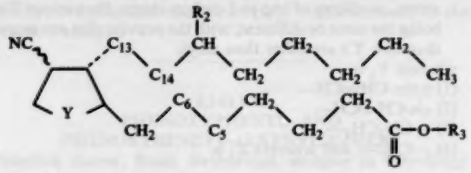
Charles V. Grudzinskas, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 24, 1972, Ser. No. 274,559

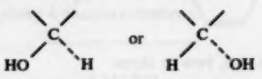
Int. Cl.[2] C07C *121/46, 121/48, 69/74, 61/38*

U.S. Cl. 260—464 11 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R_2 is hydroxy, formyloxy, lower alkanoyloxy, lower alkylsulfonyloxy, tetrahydropyranyloxy, tri(lower alkyl)-silyloxy or lower alkyl; R_3 is hydrogen or an alkyl group having from 1 to 12 carbon atoms; Y is a divalent radical selected from the group consisting of:



the moiety $-C_5-C_6-$ is ethylene or cis-vinylene and the moiety $-C_{13}-C_{14}-$ is ethylene or trans-vinylene; with the proviso that when $-C_5-C_6-$ is cis-vinylene then $-C_{13}-C_{14}-$ must be trans-vinylene; and the pharmaceutically acceptable salts cationic salts thereof when R_3 is hydrogen.

4,141,915

METHOD OF PREPARING α-SUBSTITUTED CYANOACETIC ACID ALKYL ESTERS

Moustafa El-Chahawi, Troisdorf; Uwe Prange, Niederkassel; Hermann Richtzenhain, Much-Schwellenbach, and Wilhelm Vogt, Cologne, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,177

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639327

Int. Cl.[2] C07C *120/00*

U.S. Cl. 260—465 D **18 Claims**

1. A process for preparing an α-substituted cyanoacetic acid alkyl ester of the formula

III

wherein

R is a primary, secondary or tertiary saturated alkyl moiety of 1 to 20 carbon atoms,

R^1 is methyl, ethyl, isopropyl, cyanomethyl or benzyl,

R^2 is hydrogen or methyl which comprises contacting an α,β-unsaturated nitrile of the formula

I

wherein

R^2 has the previously assigned significance and

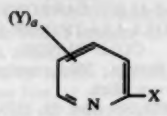
R^3 is CH_2, $CHCH_3$, CHCN, CHC_6H_5 or $C(CH_3)_2$ with an alcohol of the formula

ROH

II

wherein

R has the previously assigned significance and carbon monoxide in the presence of $Co_2(CO)$ 8 and an α-substituted pyridine which has the formula



wherein

X is a primary or secondary or tertiary alkyl moiety of 1 to 4 carbon atoms, which can be olefinically unsaturated, or a benzyl moiety which can be alkyl-substituted, or halogen or a phenyl moiety, or an alpha-pyridyl moiety, Y is a C_1 to C_4 alkyl moiety or halogen, a is 0 to 2 in the absence of hydrogen at an elevated temperature and pressure.

4,141,916

3,4,5-TRICHLORO-N,N-DI(LOWERALKYL)-2-((CHLOROMETHYL)THIO)BENZENESULFONAMIDES

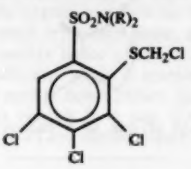
Christian T. Goralski, Midland, and George A. Burk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 13, 1978, Ser. No. 877,059

Int. Cl.[2] C07C *143/78*

U.S. Cl. 260—556 AR **5 Claims**

1. A compound corresponding to the formula



wherein each R represents alkyl of 1 to 4 carbon atoms.

4,141,917

PROCESS FOR THE PREPARATION OF TRIAMINO BENZENES BY CATALYTIC HYDROGENATION OF 2,4-DINITRO ANILINES

Walter Kunstmann, Neuenhain, and Bernhard Mees, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

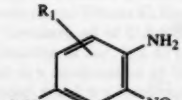
Filed Nov. 6, 1975, Ser. No. 629,678

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1974, 2453055

Int. Cl.[2] C07C *85/11*

U.S. Cl. 260—580 **12 Claims**

1. A process for preparing a 1,2,4-triamino-benzene which comprises hydrogenating in the presence of a hydrogenation catalyst a 2,4-dinitro-aniline of the formula:



wherein R_1, if in the 6-position, is hydrogen, halogen or methyl, and if in the 5-position, is hydrogen or methyl, in water containing a carboxylic acid of the formula

$$(HOOC)_n - R - COOH$$

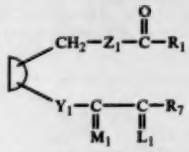
wherein n is 0 or 1 and, if n is 0, R is hydrogen, phenyl or alkyl of 1 to 4 carbon atoms, and if n is 1, R is a direct bond, phenylene or alkylene of 1 to 4 carbon atoms.

4,141,918
2-DECARBOXY-2-ALKYLCARBONYL-3,7-INTER-M-PHENYLENE-3-OXA-4,5,6-TRINOR-11-DEOXY-PGE$_1$. COMPOUNDS

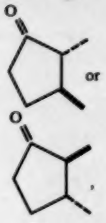
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,265
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—590 C 29 Claims

1. A prostaglandin analog of the formula

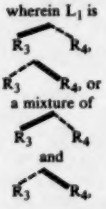


wherein is

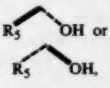


wherein R_1 is alkyl of one to 4 carbon atoms, inclusive;
wherein L_1 is

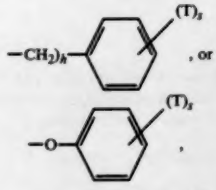
wherein L_1 is



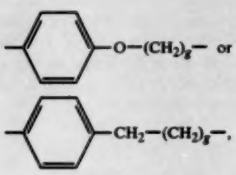
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is



wherein h is zero to three, inclusive,
wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans-CH=CH—
(2) cis-CH=CH—
(3) $—CH_2CH_2—$, or
(4) —C≡C—; and wherein Z_1 is



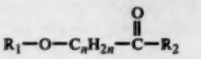
wherein g is one, two or three.

4,141,919
PROCESS FOR PRODUCING ALKOXY KETONES

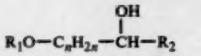
Claude Gremmelmaier, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 760,193
Int. Cl.[2] C07C *45/16*
U.S. Cl. 260—594 8 Claims

1. A process for the production of an alkoxy ketone of the formula I



wherein
R_1 represents an alkyl group having 1 to 8 carbon atoms,
R_2 represents hydrogen or an alkyl group having 1 to 4 carbon atoms, and
n represents 1 or 2,
by dehydrogenation of an alkoxyalkanol of the formula II



wherein
R_1, R_2 and n have the meaning given above, on a copper-containing catalyst, which comprises the steps of:
(a) treating the catalyst with hydrogen at a temperature of 120° to 450° C. for about 15 hours:
(b) contacting the hydrogenated catalyst with the vapor of the alkoxyalkanol to be dehydrogenated at a temperature of 230° to 350° C. for 0.5 to 2 hours;
(c) treating the catalyst again with hydrogen at a temperature of 250° to 450° C. for 0.25 to 1 hour; and
(d) dehydrogenating the alkoxyalkanol of the formula at a temperature of 150° to 450° C.

4,141,920
PROCESS FOR THE PREPARATION OF TRIMETHYLSULFOXONIUM BROMIDE

Hugh L. Dryden, Jr., Deerfield; Mike G. Scaros, Arlington Heights, both of Ill., and John P. Westrich, Racine, Wis., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,726
Int. Cl.[2] C07C *148/00*
U.S. Cl. 260—607 B 5 Claims

1. In a process for the preparation of trimethylsulfoxonium bromide by reacting dimethylsulfoxide with methyl bromide, the improvement comprising the addition of a scavenger se-

lected from the group consisting of trimethyl orthoformate, triethyl orthoformate and tetramethyl orthocarbonate to the reaction mixture.

4,141,921
PHENOXYPHENYL- AND PHENOXYBENZYL-ALKYNYL ETHERS
Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 561,526, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 330,526, Feb. 8, 1973, abandoned. This application Apr. 4, 1977, Ser. No. 784,410
Claims priority, application Switzerland, Feb. 9, 1972, 1870/72; Jan. 12, 1973, 438/73
Int. Cl.[2] C07C *43/22*
U.S. Cl. 568—636 4 Claims

1. 1-Propargyloxy-4-phenoxy-benzene.

4,141,922
PROCESS FOR PURIFICATION OF 1,2-DICHLOROETHANE
Ronald J. Convers, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Feb. 21, 1978, Ser. No. 879,335
Int. Cl.[2] C07C *17/38*
U.S. Cl. 260—652 P 3 Claims

1. A method for the removal of 2-chloroethanol from 1,2-dichloroethane (EDC) mixtures containing chloral comprising:
(1) placing the 1,2-dichloroethane/2-chloroethanol mixture at a pH of at least 10,
(2) partially distilling said basic mixture to remove ethylene oxide from the resulting mixture of 1,
(3) mixing the distillate with water in contact with a strong non-halogen acid catalyst to form an aqueous phase and an organic phase, thereby converting ethylene oxide to water soluble ethylene glycol, and
(4) recovering 1,2-dichloroethane as the organic phase of
(3) while separating and disposing the aqueous phase containing ethylene glycol.

4,141,923
DEHYDROCYCLIZATION PROCESS
George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 803,693, Jun. 6, 1977, Pat. No. 4,101,418, which is a continuation-in-part of Ser. No. 699,748, Jun. 24, 1976, Pat. No. 4,046,711. This application Jun. 5, 1978, Ser. No. 912,707
Int. Cl.[2] C07C *15/02*; B01J *29/12*
U.S. Cl. 260—673.5 21 Claims

1. A process for the catalytic dehydrocyclization of a dehydrocyclizable hydrocarbon which comprises passing and hydrocarbon in contact with a germanium-promoted platinum group metal catalyst at dehydrocyclization reaction conditions, said catalyst having been prepared by impregnating a porous high surface area carrier material with a non-aqueous solution of a platinum group metal compound and a halo-substituted germane containing less than 4 halo substituents in an amount to provide a final catalyst containing from about 0.05 to about 1.0 wt. % platinum group metal and from about 0.05 to about 1.0 wt. % germanium, and drying and calcining the thus impregnated carrier material, said platinum group metal compound being selected from the group consisting of chloroplatinic acid, platinum chloride, ammonium chloroplatinate, dinitrodiaminoplatinum, palladium, chloride, chlorpalladic acid, rhodium chloride, ruthenium chloride, ruthenium oxide, osmium chloride and iridium chloride.

4,141,924
THREE PHASE CRYSTALLIZATION
Yun C. Sun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 794,375, Jan. 27, 1969, Pat. No. 4,079,087. This application Nov. 11, 1977, Ser. No. 850,512
Int. Cl.[2] C07C *7/14*
U.S. Cl. 260—674 R 4 Claims

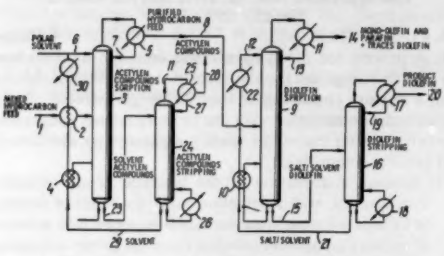
1. A process for purifying a crude aromatic hydrocarbon having 1 to 3 rings and the alkyl substituted derivatives thereof from a mixture containing at least 25 weight percent of said compound, contaminated with one or more related congeneric impurities which cannot be readily separated by distillation, said process comprising:
(1) forming a dispersion of the liquefied crude aromatic hydrocarbon, said liquefaction being the result of melting or solvent solution, in an immiscible aqueous 20% solution of an inert compound selected from the group consisting of NaCl, NH_3, $CaCl_2$, $(NH_4)_2SO_4$, or $(NH_4)_3PO_4$ by agitating a mixture of the two wherein said aqueous liquid is substantially immiscible with both (a) the aromatic hydrocarbon, and (b) the mother liquor phase composed of the liquid impurities and solvent, if any, containing the liquid impurities, and the said aqueous liquid has a density between (a) and (b),
(2) effecting crystallization of the aromatic hydrocarbon to be purified while maintaining the dispersion;
(3) centrifuging the mixture to permit the formation of three phases, i.e., a solid crystalline phase, an aqueous liquid phase, and a mother liquor phase, said aqueous liquid phase having sufficient height to completely separate the crystalline and mother liquor phases; and
(4) separating the crystals from step (3) without contact between the crystals and mother liquor.

4,141,925
SEPARATING UNEQUALLY SATURATED HYDROCARBONS WITH MONOVALENT COPPER SALT SOLUTIONS IN β-METHOXYPROPIONITRILE
Stanislav J. Pavlov, ulitsa Volodarskogo, 15, kv. 46; Valentina A. Stepanova, Uglichskoe shosse, 10, kv. 11; Olga V. Bogdanova, ulitsa Pervomaiskaya, 9, kv. 46; Sergei G. Kuznetsov, ulitsa Sovetskaya, 23/32, kv. 11; Tatyana G. Dorofeeva, Moskovsky prospekt, 82, kv. 87; Alexandr N. Bushin, ulitsa Pervomaiskaya, 9, kv. 21; Gennady A. Stepanov, ulitsa Pervomaiskaya, 9, kv. 3; Leonid K. Eratov, ulitsa Bljukhera, 36, kv. 5; Ariadna B. Kirnos, ulitsa Pervomaiskaya, 9, kv. 5; Boris A. Plechev, prospekt Lenina, 55, kv. 60, all of Yaroslavl; Alexei P. Kharchenko, ulitsa 2 Burovaya, 13, kv. 22; Konstantin N. Bildinov, ulitsa Marshala Rybalko, 96, kv. 37, both of Perm; Oleg P. Yablonsky, Flotsky spusk, 1a, kv. 23; Jury V. Orlov, ulitsa Volkova, 2/4, kv. 2, both of Yaroslavl; Boris E. Ivanov, ulitsa Krasnaya pozitsia, 91, kv. 69, Kazan; Valerian M. Sobolev, naberezhnaya M.Gorkogo, 46/50, kv. 185, Moscow; Mikhail A. Korshunov, ulitsa Pervomaiskaya, 9, kv. 41, Yaroslavl; Svetlana B. Boikova, ulitsa Chkalova, 18, kv. 30, Yaroslavl, and Rimma G. Kuzovleva, ulitsa Sverdlova, 23a, kv. 16, Yaroslavl, all of U.S.S.R.
Continuation of Ser. No. 630,667, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 545,713, Jan. 30, 1975, abandoned, which is a division of Ser. No. 228,822, Feb. 24, 1972, abandoned. This application Oct. 12, 1976, Ser. No. 731,451
Claims priority, application U.S.S.R., Feb. 26, 1971, 1624002; Feb. 26, 1971, 1624003; Feb. 26, 1971, 1626691
Int. Cl.[2] C07C *7/00*
U.S. Cl. 260—681.5 C 5 Claims

1. A method of separating mixtures of unequally saturated C_4–C_5 hydrocarbons comprising the steps of:
contacting said mixtures with a separating agent, said separating agent being a solution of salts of monovalent copper of oxygen-containing acids partially or completely dissociated in β-methoxypropionitrile, whereupon the C_4–C_5

hydrocarbons that are more highly unsaturated are selectively absorbed forming an intermediate solution;

physically separating the less highly unsaturated hydrocarbon from the intermediate solution; and



desorbing said separating agent from said intermediate solution to release the more highly unsaturated C_4–C_5 hydrocarbons.

4,141,926

METHOD FOR PREPARING EPOXY-MODIFIED SILICON RESINS

Kinji Ariga, Tokyo, and Shiro Gomyo, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1975, Ser. No. 606,976

Claims priority, application Japan, Aug. 29, 1974, 49-99288

Int. Cl.[2] C08L *63/02, 63/04, 63/00;* C08G *59/68*

U.S. Cl. 260—824 EP **13 Claims**

1. A method for the preparation of an epoxy-modified silicone resin comprising reacting an organosilicon compound represented by the average unit formula

$$R^1_aSi(OR^2)_bO_{\frac{4-a-b}{2}}$$

where R^1 is a substituted or unsubstituted monovalent hydrocarbon group, R^2 is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, a is a positive number equal to or larger than 0.2 but smaller than 4, and b is a positive number equal to or larger than 0.001 but smaller than 4 with the proviso that (a+b) is equal to or smaller than 4, with an epoxy compound having at least two epoxy groups per molecule, in the presence of a catalyst selected from the class consisting of at least one alkali halide represented by the general formula MX, where M is an alkali metal and X is a halogen atom.

4,141,927

NOVEL POLYETHERIMIDE-POLYESTER BLENDS

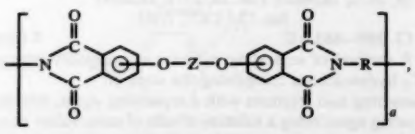
Dwain M. White, and Robert O. Matthews, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 22, 1975, Ser. No. 580,061

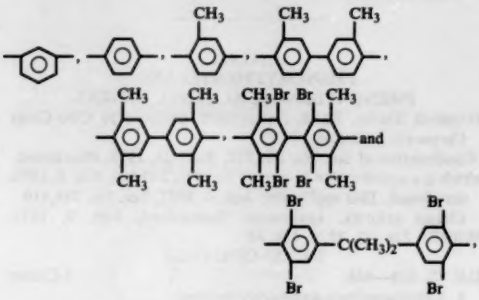
Int. Cl.[2] C08L *79/08*

U.S. Cl. 260—857 PA **12 Claims**

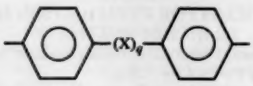
1. A polyetherimide-polyester blend comprising: (A) a PEI of the formula



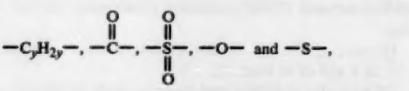
where a represents a whole number in excess of 1, —O-Z-O— is in the 3 or 4-, and 3′ or 4′- positions and Z is a member of the class consisting of (1)



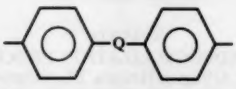
and (2) divalent organic radicals of the general formula



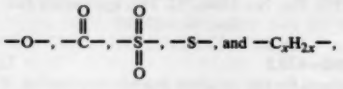
where X is a member selected from the class consisting of divalent radicals of the formulas



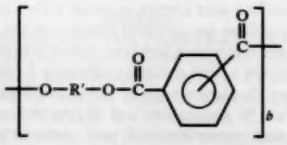
where q is 0 or 1, y is a whole number from 1 to 5, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of



and x is a whole number from 1 to 5 inclusive, and (B) a PE of the formula



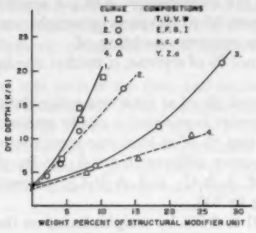
where b represents a whole number in excess of 1, R′ is a divalent alkylene radical containing from 1 to 10 carbon atoms, and the two carbonyl groups are located on the aromatic ring in a para- or meta- position relative to each other.

4,141,928

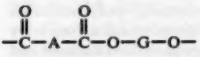
POLYESTER AND PROCESS FOR MAKING SAME

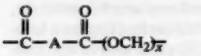
Ernest L. Lawton, II, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

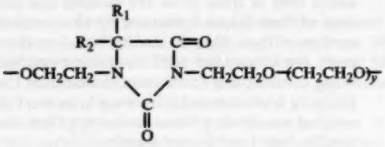
Division of Ser. No. 691,659, Jun. 1, 1976, Pat. No. 4,122,072.
This application Jan. 11, 1978, Ser. No. 868,559
Int. Cl.[2] C08G *63/12, 63/18, 63/66, 63/76*
U.S. Cl. 260—860 11 Claims



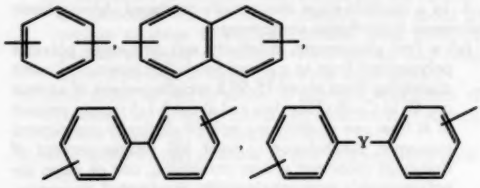
1. A process for preparing a copolyester consisting essentially of recurring units of the formula


(I)


(II)



comprising heating at a temperature of at least 150° C. and in the presence of a suitable catalyst a mixture composed of a first polyester consisting essentially of recurring units (I) and a second polyester consisting essentially of recurring units (II), wherein up to 20% by weight of said mixture consists of said second polyester; wherein A is a radical selected from the group consisting of



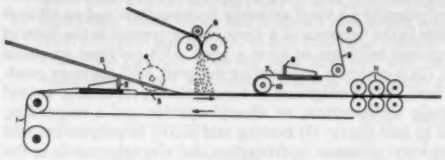
and branched or linear alkylene radicals containing from 4 to 10 carbon atoms; wherein Y is selected from the group consisting of branched or linear C_1–C_4 alkylenes, —O—, —S—, and —SO_2—; wherein G is selected from the group consisting of branched or linear C_2–C_{10} alkylenes and C_5–C_{10} cycloalkylenes; wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, aryls containing from 6–10 carbon atoms, alkyls containing from 1–20 carbon atoms, and cycloalkyls containing from 5–10 carbon atoms; and wherein x is an integer from 0–20, y is an integer from 0–20 and the sum of x+y is from 1 to 30.

4,141,929

UNIDIRECTIONAL SHEET MOLDING COMPOSITION AND PROCESS OF PREPARING SAME

Reginald B. Stoops, Gainesville, Fla., and John M. Maxel, St. Charles, Ill., assignors to Armco Inc., Middletown, Ohio

Filed Nov. 7, 1974, Ser. No. 521,750
Int. Cl.[2] C08F *43/08*
U.S. Cl. 260—862 15 Claims



1. A process of preparing a thickened resinous sheet molding composition suitable for compression molding containing axially aligned continuous filaments and cut filaments which comprises preparing a slurry of an unsaturated cross linkable polyester of a dicarboxy acid and a dihydric alcohol, a liquid cross linking monomer capable of cross linking with said polyester to produce a thermosetting resin, a catalyst for the cross linking reaction, an inhibitor for the cross linking reaction, and a mold release compound, adding a thickening reactant to said mixture, stirring the resultant mixture, forming said mixture into a first layer on a strippable carrier sheet, adding 10% to 70% by weight of continuous high modulus elasticity filaments unidirectionally to said layer, adding randomly deposited cut filaments to said layer, applying a second layer of said composition and a second strippable sheet to the top of said layer to produce a composite molding sheet in which said continuous filaments are embedded unidirectionally in said resinous molding sheet, and ageing said composite molding sheet until a dry handable composite sheet is obtained from which said strippable sheets can be stripped and which is then suitable for compression molding between matched dies.

4. The product resulting from the process of claim 1.

4,141,930

HYDROGENATION OF GLYCOLIC ACID

Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 17, 1978, Ser. No. 896,944
Int. Cl.[2] C07C *31/20*
U.S. Cl. 568—864 3 Claims

1. In a process for producing ethylene glycol by catalytic liquid phase hydrogenation of glycolic acid, the improvement comprising hydrogenating glycolic acid in the presence of a catalyst consisting essentially of metallic cobalt and from about 5 to 20 percent by weight thorium oxide based on the combined weight of metallic cobalt and thorium oxide.

4,141,931

NITROGENOUS POLYMER COMPOSITION EMITTING REDUCED AMOUNTS OF HYDROGEN CYANIDE ON COMBUSTION

Gary L. Deets, and Speros P. Nemphos, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 20, 1977, Ser. No. 807,869
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—876 R 7 Claims

1. A polymer composition comprising a nitrogenous polymer and from 2.5 to 20 percent by weight, based on the polymer weight, of an alkaline earth metal oxide and from 2.5 to 20 percent by weight of a polysulfide rubber.

4,141,932

COMBINED EMULSION AND SUSPENSION PROCESS FOR PRODUCING GRAFT ABS BEAD-LIKE PARTICLES

James M. Butler, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 3, 1977, Ser. No. 839,090
Int. Cl.[2] C08F 279/04
U.S. Cl. 260—880 R 9 Claims

1. A method of preparing an ABS polymer which comprises (1) polymerizing a vinyl aromatic hydrocarbon and an alkenyl cyanide in the presence of a diene rubber present in the form of an aqueous emulsion to form a graft ABS polymer emulsion latex; (2) completely coagulating the graft ABS polymer emulsion latex with a coagulant to form a slurry; (3) adding a vinyl aromatic hydrocarbon, an alkenyl cyanide and a suspending agent to said slurry; (4) heating said slurry to polymerize said added vinyl aromatic hydrocarbon and alkenyl cyanide in the presence of said graft ABS polymer; and (5) recovering the thus produced ABS polymer in bead-like form.

4,141,933

PROCESS FOR PRODUCING ABS RESINS

William J. I. Bracke, Hamme, Belgium, assignor to Laborfina S.A., Brussels, Belgium

Continuation of Ser. No. 705,389, Jul. 15, 1976, abandoned, which is a continuation of Ser. No. 553,608, Feb. 27, 1975, abandoned, and Ser. No. 553,609, Feb. 27, 1975, abandoned. This application Dec. 28, 1977, Ser. No. 865,223
Claims priority, application Belgium, Oct. 24, 1974, 04/149844
Int. Cl.[2] C08F 279/04
U.S. Cl. 260—880 R 10 Claims

1. A process for producing ABS resins by copolymerizing a mixture of a styrene compound and an unsaturated nitrile selected from the group consisting of acrylonitrile and methacrylonitrile, in the presence of an elastomer, by a two-step process comprising a mass copolymerization step and then a suspension copolymerization step, said process comprising carrying out the mass copolymerization step in the presence of p-chlorobenzoyl peroxide as an initiator and dithiobis-(benzothiazole) as a chain transfer agent.

4,141,934

CONTINUOUS BULK POLYMERIZATION PROCESS

Frank Wingler, Leverkusen; Adolf Schmidt, Cologne; Lothar Liebig, and Gerd Wassmuth, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 668,984
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513253; Sep. 11, 1975, 2540517
Int. Cl.[2] C08F 2/02, 257/02
U.S. Cl. 260—881 4 Claims

1. A process for the continuous production of a thermoplastic moulding composition comprising a statistical copolymer having an intrinsic viscosity of from 0.1 to 2 dl/g, as measured in dimethyl formamide at 25° C., and a dimension stability under heat of from 90° C. to 130° C., and consisting of copolymerised units of

A. 22 to 96 mol % of styrene or α-methyl styrene or a mixture thereof,

B. 0 to 78 mol % of at least one monoolefinically unsaturated monomer containing a nitrile group, and

C. 0 to 50 mol % of at least one monoolefinically unsaturated monomer different from A and B, wherein the sum of A, B and C amounts to 100 mol %, the process comprising the following steps: a first process step carried out at a temperature of from 60° C. to 150° C. and under a pressure of from 1 to 20 bars, in the presence of an initiator having a half life (at the polymerisation temperature) of $\leqq 1/10$th of the average residence time and $\geqq$ the mixing time in a continuous-flow, ideally mixed tank reactor, with an average residence time of from 10 to 240 minutes and mixing time of from 5 to 120 seconds, wherein 100 parts by weight of a monomer mixture of

A_1 4 to 99.6 mol % of styrene, α-methyl styrene or a mixture thereof,

B_1 0 to 96 mol % of at least one monoolefinically unsaturated monomer containing a nitrile group, and

C_1 0 to 80 mol % of at least one monoolefinically unsaturated monomer different from A_1 or B_1, per unit of time are continuously copolymerised in bulk with remixing up to a conversion of from 10 to 60 mol % to form a copolymer with the composition ABC; a second process step wherein from 0.5 to 100 parts by weight per unit of time of a monomer mixture consisting of

A_2 0 to 100 mol % of styrene, α-methyl styrene or a mixture thereof,

B_2 0 to 100 mol % of at least one monoolefinically unsaturated monomer containing a nitrile group, and

C_2 0 to 100 mol % of at least one monoolefinically unsaturated monomer different from A_2 or B_2, the sum of the mol % of $A_1B_1C_1$ and $A_2B_2C_2$, respectively, always amounting to 100,

and from 0.01 to 0.5% by weight, based on the sum of residual monomers of $A_1B_1C_1$ and monomers $A_2B_2C_2$, of an initiator having a half life (at the polymerisation temperature of process stage 3) of $\leqq 1/10$th of the residence time and $\geqq$ than the mixing time, are added to the polymerisation mixture per unit of time; and a third process step, carried out continuously in homogeneous phase, in bulk, in a completely flooded, self-cleaning polymerisation kneader with mobile kneading fittings which sweep over the entire inner volume of the polymerisation kneader and completely strip both the wall and one another wherein, copolymerisation is continued with backmixing at a temperature of from 100° C. to 250° C. over an average residence time of from 10 to 480 minutes and with a mixing time of from 0.1 to 4 minutes, up to a residual monomer content of from 10 to 50 mol %, based on the total monomers, the copolymer ABC containing residual monomer being continuously freed from the residual monomers by applying a vacuum or by blowing in an inert gas, until the residual monomer content amounts to less than 0.5% by weight, based on the copolymer.

4,141,935

THERMOPLASTIC FILM HAVING IMPROVED OUTDOOR WEATHERABILITY

David L. Dunkelberger, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 10, 1978, Ser. No. 876,805
Int. Cl.[2] C08L 31/02
U.S. Cl. 260—885 8 Claims

1. In a multiple-stage sequentially-produced thermoplastic polymeric composition comprising:

(a) a first elastomeric, relatively soft first-stage polymer polymerized from an aqueous emulsified monomer system containing from about 75–99.8 weight percent of at least one C_1 to C_8 alkyl acrylate and about 0.1–5 weight percent of at least one crosslinking polyethylenically unsaturated monomer, the balance to total 100 weight percent of first-stage monomer system comprising one or more copolymerizable monoethylenically unsaturated monomers, and the monomer system being chosen so that the maximum glass transition temperature is not over −20° C.;

(b) a second-stage polymer polymerized, in the presence of the resultant aqueous system from the first-stage polymerization, from an aqueous emulsified monomer system containing about 10–90 weight percent of at least one C_1 to C_8 alkyl acrylate, and 9–89.9 weight percent of at least one C_1 to C_4 alkyl methacrylate;

(c) a third-stage polymer polymerized, in the presence of the resultant aqueous system from the second-stage polymerization from an aqueous emulsified monomer system containing about 5–40 weight percent of at least one C_1 to C_8

alkyl acrylate and about 95–60 weight percent of at least one C_1 to C_4 alkyl methacrylate; and

(d) a final fourth-stage polymer polymerized, in the presence of the resultant aqueous system from the third-stage polymerization, from an aqueous emulsified monomer system containing about 80–100% weight percent of at least one C_1 to C_4 alkyl methacrylate and the balance, to total 100 weight percent of the fourth-stage monomer system, of at least one C_1 to C_8 alkyl acrylate; the weight of the first-stage monomer system being about 10–75% of the total weight of the polymer composition and the weight of the subsequent stages being about 90–25% of the total weight of the polymeric composition, the improvement characterized by:

incorporating into each of the first- and second-stage monomer systems from about 0.1 to 1 weight percent of at least one graftlinking monomer which is a copolymerizable monomer containing at least two addition polymerizable unsaturated functional groups, each of which polymerize at substantially different rates with respect to each other.

4,141,936

HIGH IMPACT STRENGTH POLYMER TRIBLENDS

Ervin G. Pritchett, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,133

Int. Cl.[2] **C08L** *23/08, 35/06*

U.S. Cl. 260—897 C **22 Claims**

1. Compatibilized polymer triblends which comprise:

a. from about 5 to about 40 pph of at least one resin selected from the group consisting of:

i. a copolymer of ethylene and vinyl acetate containing from about 25 percent to about 75 percent vinyl acetate, and

ii. a terpolymer of ethylene, vinyl acetate and the theoretical monomer vinyl alcohol containing from about 20 percent to about 80 percent ethylene, from about 18 percent to about 60 percent vinyl acetate and from about 2 percent to about 20 percent vinyl alcohol;

b. from about 50 pph to about 95 pph of a copolymer of styrene and acrylonitrile containing from about 15 percent to about 40 percent acrylonitrile; and,

c. from about 0.1 pph to about 40 pph of a chlorinated polyethylene.

11. Compatibilized polymer triblends which comprise:

a. from about 5 to about 40 pph of at least one resin selected from the group consisting of:

i. a copolymer of ethylene and vinyl acetate containing from about 25 percent to about 75 percent vinyl acetate, and

ii. a terpolymer of ethylene, vinyl acetate and the theoretical monomer vinyl alcohol containing from about 20 percent to about 80 percent ethylene, from about 18 percent to about 60 percent vinyl acetate and from about 2 percent to about 20 percent vinyl alcohol;

b. from about 50 pph to about 95 pph of a copolymer of styrene and acrylonitrile containing from about 15 percent to about 40 percent acrylonitrile; and,

c. from about 0.1 pph to about 40 pph of a polyvinyl chloride.

4,141,937

SOLVENT RECOVERY PROCESS

Charles R. Bergeron, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

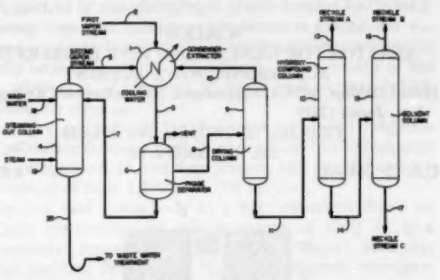
Continuation-in-part of Ser. No. 275,248, Jul. 26, 1972, abandoned. This application Apr. 14, 1976, Ser. No. 676,858

Int. Cl.[2] **C07C** *7/02;* **C07F** *9/24*

U.S. Cl. 260—927 N **10 Claims**

1. A process for the recovery of materials including solvent, hydroxy compound and tertiary amine acid acceptor used in the manufacture of alkyloxy and aryloxyphosphazenes whereby said materials are rendered suitable for recycle to such manufacture, said process comprising the steps of

(a) contacting a first vapor stream from the distillation of washed alkyloxy or aryloxyphosphazene, said first vapor stream containing solvent composed of (i) heptane and (ii) chlorobenzene and further containing tertiary amine acid acceptor selected from trimethylamine, triethylamine and pyridine, with a second vapor stream produced from the water used to wash said alkyloxy or aryloxyphosphazenes, containing water vapor and hydroxy compound selected from propanol and phenol, in heat exchange relation with a cooling medium whereby said first and said second vapor streams are condensed, forming an organic phase



and an aqueous phase with the simultaneous extraction of a substantial portion of said hydroxy compound into said organic phase;

(b) separating said organic phase from said aqueous phase; and heating said organic phase to a temperature sufficient to vaporize substantially all of the water remaining in the organic phase, but not sufficient to distill substantial amounts of the organic components;

(c) distilling substantially water free organic phase to produce a stream enriched in said hydroxy compound, a stream enriched in said solvent and a stream enriched in said tertiary amine acid acceptor, and wherein the enriched streams are recycled to the manufacture of said alkyloxy or aryloxyphosphazenes.

4,141,938

PRODUCTION OF ACID ORTHOPHOSPHORIC ACID ESTER MIXTURES

Werner Klose, Erftstadt Liblar, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 838,464, Oct. 3, 1977, abandoned. This application Nov. 16, 1977, Ser. No. 851,944

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645211

Int. Cl.[2] **C07F** *9/09*

U.S. Cl. 260—928 **12 Claims**

1. Mixtures of acid phosphoric acid esters, the mixtures having been made by a process wherein P_4O_{10} is reacted by mixing or kneading it with a blend consisting of a monohydric alcohol and an alkane polyol containing 2 to 12 carbon atoms and 2 to 6 hydroxyl groups in a molar ratio of P_4O_{10} to monohydric alcohol to alkane polyol of 1 to 2 to 4/n, n being the number of hydroxyl groups present in the alkane polyol molecule; carrying out the reaction at approximately 0° to 120° C. in the presence of an inert gas and over a period of approximately 1 to 6 hours; and cooling the resulting reaction product.

2. In a process for making a mixture of orthophosphoric acid esters by reacting phosphorus(V)-oxide with a mixture of a monohydric alcohol and a polyhydric alcohol under anhydrous conditions, the improvement which comprises: reacting P_4O_{10} by mixing or kneading it with a blend consisting of a monohydric alcohol and an alkane polyol containing 2 to 12 carbon atoms and 2 to 6 hydroxyl groups in a molar ratio of P_4O_{10} to monohydric alcohol to alkane polyol of 1 to 2 to 4/n,

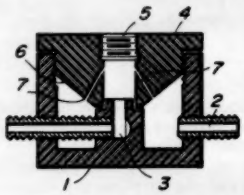
n being the number of hydroxyl groups present in the alkane polyol molecule; carrying out the reaction at approximately 0° to 120° C. in the presence of an inert gas and over a period of approximately 1 to 6 hours; and cooling the resulting reaction product.

4,141,939

AERATOR FOR GENERATING FINE BUBBLES BY SUPERSONIC WAVE ACTION

Hikoji Oshima, 3474-1, Nishionuma, Sagamihara-shi Kanagawa-ken, Japan (229)

Filed Jun. 10, 1977, Ser. No. 805,430
Int. Cl.[2] B05B 1/10
U.S. Cl. 261—1 **1 Claim**



1. An aerator apparatus for generating fine bubbles from a mixture of liquid and gas comprising:

(a) a casing including a bottom portion with an enclosure forming wall portion extending upwardly therefrom, a lid member disposed on top of said wall;

(b) inlet means extending through said casing for admission of air into said casing from a source externally thereof;

(c) nozzle means for introducing liquid into said casing, said nozzle means including an exit disposed inside of said casing and an inlet passage extending from outside of said casing, through said casing and in communication with said exit;

(d) means defining a resonant cavity or chamber disposed internally of said casing in spaced-apart nozzle means with the exit of said nozzle means in position to introduce liquid into said resonant cavity or chamber;

(e) outlet means extending through said casing through which fluid may be discharged or ejected from said casing, said outlet means being in alignment with said resonant cavity or chamber and said nozzle means, said outlet means also being at a downstream end of said resonant cavity or chamber opposite from nozzle means; and

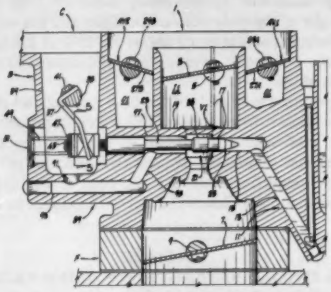
(f) a plurality of pores extending through said means defining resonant cavity or chamber whereby as motive liquid is effused through said nozzle means into said resonant cavity or chamber, air admitted into said casing through said inlet means will be drawn into said resonant cavity or chamber through said plurality of pores and will mix with liquid to form bubbles thereby producing aerated liquid which is thereafter ejected through said outlet means in a spurt or jet, wherein said means defining said resonant cavity or chamber is formed with a tapered outer surface diverging from said nozzle means in the direction toward said lid member and a generally cylindrical inner surface, and said plurality of pores extend obliquely through said means defining said resonant cavity or chamber.

4,141,940

CARBURETOR FUEL FLOW CONTROL

Silas O. Dye, Highland, Ill., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,698
Int. Cl.[2] F02M 7/22
U.S. Cl. 261—23 A **15 Claims**



1. A staged carburetor for an internal combustion engine comprising:

a carburetor body in which at least one pair of induction passages is formed for air to be drawn into said engine, said pair of induction passages including an inner induction passage having a venturi therewithin and an outer induction passage encircling said inner induction passage;

a throttle valve positioned at the outlet of said pair of induction passages and movable between a closed and an open position to control the flow of air through said induction passages;

at least one fuel circuit through which fuel is delivered from a source thereof to said inner induction passage, said fuel circuit having an outlet at said venturi;

a fuel metering rod extending transversely of said induction passages and having a variable diameter end portion projecting into said fuel circuit outlet, said metering rod being movable relative to said outlet to vary the quantity of fuel delivered and said metering rod having an enlarged diameter section intermediate its length which further reduces the cross-sectional area of said inner induction passage at said venturi and increases the pressure drop created thereat;

an air valve positioned in said outer induction passage and normally closing said passage whereby air is initially drawn into said engine only through said inner induction passage, an increased demand for air by said engine resulting in an opening force being exerted on said air valve to open it so air is drawn into said engine through both induction passages;

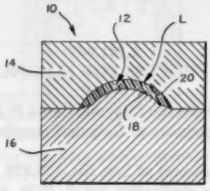
means linking said air valve to said metering rod to move said metering rod relative to said fuel circuit outlet as said air valve opens thereby to change the quantity of fuel drawn into said inner induction passage, the quantity of fuel delivered to said inner induction passage at any one time mixing with the air flowing through said pair of induction passages at that time to produce an air-fuel mixture combusted in said engine, and;

means for bleeding atmospheric air into said inner induction passage at said venturi to modulate the pressure drop created thereat and control the air-fuel ratio of the mixture produced in said induction passages.

4,141,941
CONTACT LENS CASTING METHOD

Edward A. Travnicek, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sep. 21, 1977, Ser. No. 835,114
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 12 Claims



1. The method of making a contact lens of an ophthalmic quality resin comprising:

preparing a casting precursor by adding to the resin an extractable, non-reactive, miscible diluent in an amount precontrolled according to a subsequent volume reduction desired of the precursor after casting;

filling a mold casting cavity of predetermined fixed shape and size with said precursor;

at least partially curing the thus cast precursor in situ;

removing the resulting cast lens from said cavity; and

extracting said diluent from the cast lens to shrink the lens to a size smaller than that of said casting cavity, said size reduction corresponding to said amount of said diluent added to said precursor.

4,141,942
PROCESS FOR PREPARING FIBROUS MATERIALS BY WET METHOD

Junichiro Maehara, Sodegaura, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 689,801, May 25, 1976, abandoned.
This application May 8, 1978, Ser. No. 903,572
Claims priority, application Japan, Jun. 4, 1975, 50-67400; Jun. 23, 1975, 50-77289
Int. Cl.[2] B22D *23/08;* D01F *6/00*
U.S. Cl. 264—9 18 Claims

1. A process for preparing a fibrous material by wet method from a starting solution for a fibrous material, which comprises:

forming a coagulation bath containing an upper liquid phase and a lower liquid phase, said liquid phases being immiscible with each other, defining an interface area with each other, and at least one of the two liquid phases having a sufficient coagulating ability to make the starting solution into a gel,

feeding the starting material to said interface area in the bath,

spinning the starting solution and forming the fibrous material in the course of traveling in the interface area through the coagulation bath, and

reeling the formed fibrous material,

the relationship between coagulating values and specific gravities of said liquid phases and the specific gravity of said starting solution being

(A) $G_2 > G_1 \geqq G_0$ when $P_1 \leqq 20 \leqq P_2$,

(B) $G_0 \geqq G_2 > G_1$ when $P_2 \leqq 20 \leqq P_1$, and

(C) $G_2 \geqq G_0 \geqq G_1$ when $P_1 \leqq 20 \leqq P_2$ or $P_2 \leqq 20 \leqq P_1$,

wherein

G_0 is the specific gravity of the starting solution,

G_1 is the specific gravity of the upper of said two liquid phases in said bath,

G_2 is the specific gravity of the lower of said two liquid phases in said bath,

P_1 is the coagulation value of said upper phase, and

P_2 is the coagulation value of said lower phase.

4,141,943
METHOD OF MANUFACTURING PLASTIC-BONDED (LNCO) MAGNETS

Jaroslav Houska, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 21, 1977, Ser. No. 835,061
Claims priority, application Switzerland, Oct. 4, 1976, 12539/76
Int. Cl.[2] H01F *1/08*
U.S. Cl. 264—24 12 Claims

1. A method of manufacturing a plastic-bonded LnCo magnet having improved stability at temperatures around 100° C., high energy product, essentially linear demagnetization curves over the second quadrant, and uniform magnetization of the poles, where Ln = elements 57 to 71 and yttrium, which comprises the steps of

forming a green body by aligning a powdered magnetic LnCo alloy having a particle size of from 1 to 100 microns in a magnetic field, and then pressing said powder under a pressure of from 1,000 to 10,000 kp/cm^2;

subjecting said green body to a heat treatment above its Curie temperature up to a maximum of 1150° C. in a protective atmosphere for from 1 to 20 hours, such that the resultant heat-treated body is completely demagnetized;

impregnating said resultant heat-treated body with plastic in a vacuum of from about 1 to about 30 Torr. at a temperature of from about 20° to about 80° C.;

pressing the resultant impregnated body at a pressure of from 2 to 2,000 kp/cm^2;

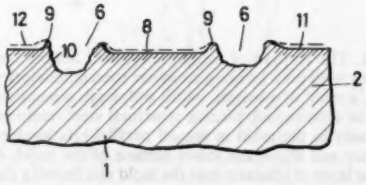
curing the resultant pressed, impregnated body, and machining to final form; and

magnetizing said cured body under the influence of a magnetic field to produce said plastic-bonded LnCo magnet.

4,141,944
PROCESS FOR THE PRODUCTION OF IMITATION WOOD FROM SYNTHETIC RESINS

Gerd L. Anstadt, and Helmut Kesseler, both of Pirmasens, Fed. Rep. of Germany, assignors to Gebrüder Kömmerling Kunststoffwerke G.m.b.H., Pirmasens, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,443
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613411
Int. Cl.[2] B29D *9/02;* B32B *3/10, 31/18*
U.S. Cl. 264—45.5 14 Claims



1. A process for producing a workpiece with an imitation wood texture, comprising the steps of forming an integral synthetic resin workpiece having a foamed plastic core and a densified outer layer; heating only spaced portions of the densified outer layer to soften the synthetic plastic material thereof while leaving the remainder of said outer layer unheated; and relief embossing the heated spaced portions to impart to said outer layer the appearance of wood grain, said outer layer including pores of unfoamed foaming agent and the step of heating including softening the outer layer about the pores and

heating the foaming agent within the pores to thereby expand the foaming agent and burst the pores whereby the simulated wood appearance is enhanced.

4,141,945

METHOD OF DISPOSING OF PRECIPITATED SILICA

Tore Anderssen, Vagsbygd, and Kjell Larsen, Sogne, both of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Continuation of Ser. No. 604,301, Aug. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,826, Mar. 20, 1974, abandoned. This application Jun. 17, 1977, Ser. No. 807,645

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—63 **3 Claims**

1. A method of forming mechanically strong metal oxide pellets to be used in smelting furnace operations from the silica dust recovered from the smoke of metallurgical processes for the production of metallic silicon or silicon-containing alloys and having a specific surface between about 15 m^2/g and 25 m^2/g by using it as a binder for making mechanically strong metal oxide-containing pellets for use in smelting furnaces comprising:

(a) recovering silica dust having a specific surface between about 15 m^2/g and 25 m^2/g from metallurgical processes for the production of metallic silicon or silicon-containing alloys;

(b) admixing said silica dust with at least one metal oxide selected from the group consisting of hematite, magnetite, chromium oxide and manganese dioxide utilizable in a smelting furnace and with water, said silica dust being present in an amount of from about 1% to about 5% and the water being present in sufficient amount to form cohering pellets;

(c) forming the admixture of step (b) into pellets; and

(d) sintering the pellets at a temperature of from 1,300° C. to about 1,400° C.

4,141,946

HOLLOW-CORE CONCRETE SLABS AND THE METHOD OF MAKING THE SAME

Gerald A. Rauenhorst, 6817 Oaklawn Ave., Minneapolis, Minn. 55435

Division of Ser. No. 703,198, Jul. 7, 1976, Pat. No. 4,041,669, which is a continuation of Ser. No. 549,140, Feb. 12, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,298

Int. Cl.[2] B28B *1/08*

U.S. Cl. 264—69 **5 Claims**

1. The method of making elongated hollow core concrete slabs with core forming members therein, comprising: providing a mold of a length, width and depth dimension of the slab to be constructed; placing structural steel reinforcing longitudinally in the mold in spaced parallel relationship to one another and above the lower surface of the mold; depositing a first layer of concrete into the mold and forming the layer with ridge shaped portions surrounding said spaced structural steel reinforcing; placing a plurality of elongated U-shaped foamed plastic core forming members having a series of spaced dividers extending transversely of the sides of the U-shaped members to define recesses therein in spaced parallel arrays longitudinally in the mold between and contacting said ridge portions of the first layer of concrete with the recesses facing said first layer of concrete; holding the core forming members in position on the first layer of concrete by applying a force to the top thereof while simultaneously depositing a second layer of concrete into the mold over the core forming members to fill the space therebetween and to cover said core forming members; said additional layer of concrete being deposited before the first layer of concrete is set; finishing the top layer of concrete over the core forming members to a desired surface; and curing the concrete in the mold with the core forming members therein.

4,141,947

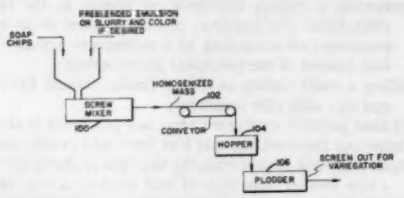
CONTINUOUS PROCESS FOR MAKING VARIEGATED SOAP

Charles F. Fischer, Jersey City, and David P. Joshi, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 539,675, Jan. 9, 1975, abandoned. This application Jul. 7, 1976, Ser. No. 703,159

Int. Cl.[2] B29F *3/12*

U.S. Cl. 264—75 **5 Claims**



1. A continuous process for making soap bars comprising the steps of:

(a) continuously feeding soap chips into the input hopper of a mixer unit that includes a screw mixer conveyor

(b) continuously feeding a pre-blended emulsion of minor soap ingredients into said input hopper of said mixer unit

(c) said emulsion containing a coloring material

(d) continuously mixing said soap chips and said emulsion

(e) said mixing step blending said minor ingredients other than coloring agent throughout the bar and producing a variegated homogenized soap mass

(f) continuously discharging said variegated soap mass from said mixer unit

(g) supplying said variegated homogeneous mass to a double barrel vacuum plodder

(h) plodding said variegated soap mass in said double barrel plodder

(i) extruding said plodded variegated soap mass and

(j) cutting said extruded variegated soap mass into bar form.

4,141,948

METHOD OF MAKING A SHAPED SILICON CARBIDE-SILICON MATRIX COMPOSITE AND ARTICLES MADE THEREBY

William Laskow, Schenectady, and Charles R. Morelock, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 354,106, Apr. 14, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 572,969

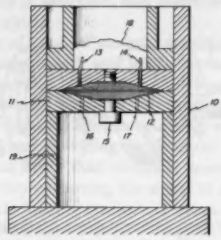
Int. Cl.[2] C04B *35/70*

U.S. Cl. 264—101 **8 Claims**

1. A method for making a silicon-carbide ceramic within ½% tolerance of the desired shape which comprises,

(1) infiltrating molten silicon at a temperature of from 1400° C. to 1800° C., into a shaped carbon-fiber part while it is

substantially contained in a mold in a non-oxidizing atmosphere and under reduced pressure, and



(2) separating the resulting silicon-carbide ceramic from the mold where the carbon fiber used in (1) has a specific gravity in the range of from about 1.3 to 1.5.

4,141,949

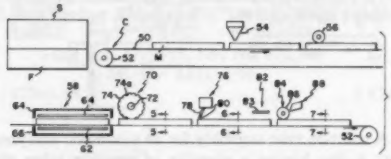
METHOD FOR MAKING PREFINISHED WALL BOARD #32

Servando G. Hinojosa, 2046 Iowa St., and Octavio G. Hinojosa, 2057 Iowa St., both of Saginaw, Mich. 48601

Division of Ser. No. 237,345, Mar. 23, 1972, Pat. No. 3,798,854. This application Mar. 12, 1974, Ser. No. 450,281

Int. Cl.[2] B32B *3/00;* **B29C** *21/00, 25/00*

U.S. Cl. 264—134 **5 Claims**



1. A method for forming plural substantially identical wall boards from preformed wall panels comprising the steps of:

placing over one side of each said wall panel a layer of moldable, settable material which when cured, will be harder than said wall panel;

creating a plurality of recesses in each layer of moldable material to provide a pattern therein having a contour which does not follow the contour of said one skide of said wall panel, said creating step being performed by relieving first and second portions of each said layer along both major side edges of each said wall panel, the first and second portions along each said edge having different degrees of relief and relief along transversely aligned portions of each said wall board being different, so that when one said wall board is installed laterally adjacent another said wallboard adjacent portions of the two wall boards have different reliefs.

4,141,950

METHOD FOR MAKING FLEXIBLE, CYLINDRICAL BEARINGS

Arnold R. Thompson, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Jan. 12, 1977, Ser. No. 758,744

Int. Cl.[2] B29C *5/00;* **B29D** *3/00;* **B29H** *7/00, 3/06*

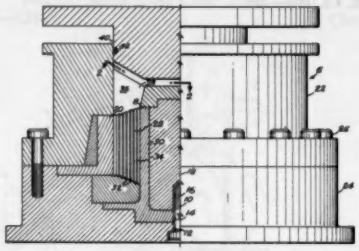
U.S. Cl. 264—138 **4 Claims**

1. The method for making a cylindrical, flexible bearing, of the type constructed of alternate, annular layers of elastomer and rigid material bonded together, that are substantially free of internal, tensile stresses at a predetermined temperature, comprising the steps of:

placing concentric, hollow cylindrical shims of rigid material in a mold between concentric, radially-spaced mounting rings;

heating the cylinders, the mold, and the uncured elastomer to the temperature at which fluidity of the elastomer is greatest;

pressing the elastomer into the mold so that spaces between the shims are filled and an excess of elastomer covers the shims so that the ends of the shims cannot limit the pressure applied;



pressurizing the elastomer in the mold to provide a hydrostatic pressure of about 10,000 to 15,000 psi, calculated to produce a stress-free bearing at a predetermined temperature according to the equation $p=k3\alpha\Delta T$ (where p is the applied pressure, k is the bulk modulus of the elastomer, is the coefficient of linear expansion, and

ΔT is the difference between the molding temperature and the temperature at which the bearing is to be stress-free), until the elastomer is cured and bonded to said shims and said mounting rings threby forming said bearing and removing the bearing from the mold.

4,141,951

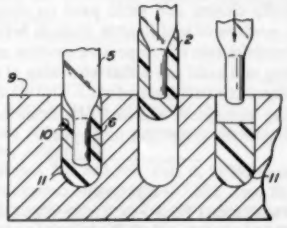
METHOD OF FORMING A PROTECTIVE COVERING ABOUT A THERMOMETER

Paul Beckman, 944 Henrietta Ave., Huntingdon Valley, Pa. 19006

Division of Ser. No. 620,586, Oct. 8, 1975, Pat. No. 4,044,614. This application Aug. 22, 1977, Ser. No. 826,473

Int. Cl.[2] B29C *13/00;* **G01K** *1/08;* **B29F** *3/00*

U.S. Cl. 264—230 **15 Claims**



1. A method for enclosing a thermometer having a bulb portion and a graduated stem portion, comprising:

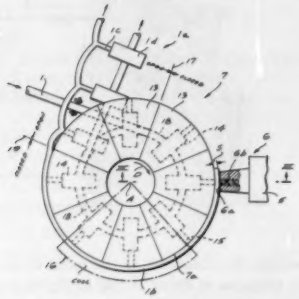
(a) forming a hardened coating, upon a bulb portion of a thermometer, of a first hardenable material having a substantial thermal conductivity;

(b) enclosing the stem portion of said thermometer in a substantially transparent second material having a substantially lower thermal conductivity than said first material.

4,141,952
METHOD OF MOLDING INSULATING DISKS ON COAXIAL-CABLE WIRE

Dieter Braun, Schildgen, Fed. Rep. of Germany, assignor to Felten & Guilleaume Carlswerk AG, Köln-Mülheim, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,358
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614937
Int. Cl.[2] B29C *5/00;* B29D *3/00;* B29F *1/00*
U.S. Cl. 264—251 10 Claims



1. A method of molding a succession of discrete bodies on an elongated flexible element using a plurality of mold pairs together forming an array having an outer surface and each having a mold cavity and an inlet between the respective cavity and said surface, said method comprising the steps of:

continuously displacing said array past the end of a generally stationary nozzle and thereby sequentially aligning said inlets with said end;

continuously feeding plastified and hardenable resin material under an adjustable pressure to said end;

maintaining spacing of said nozzle from said surface generally constant by regulating a biasing force urging said nozzle toward said surface during relative displacement of said nozzle and said mold pairs;

so that when said end aligns with an inlet it injects said resin material therethrough into the respective cavity and forms a body therein and a sprue integral therewith in the respective inlet, and so that when said end is not aligned with an inlet said material escapes laterally from between said end and said surface and forms on said surface a continuous film unitary with the previously formed sprues and having a substantially constant thickness;

sequentially closing said mold pairs on successive spaced-apart portions of said flexible element before injection of said material into the respective cavities and sequentially opening said mold pairs after hardening of said material in the respective cavities; and

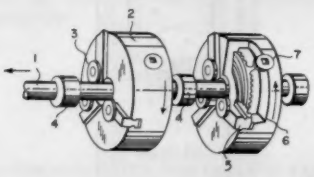
separating said sprues and said film from said bodies after opening of the respective mold pairs.

4,141,953
METHOD FOR ACCELERATING THE TRANSFORMATION OF THE CRYSTALLINE FORM OF ISOTACTIC POLYBUTENE PIPE

Andre Kepes, Le Vesinet, and Jacques Joye, Lille, both of France, assignors to Societe Chimique des Charbonnages CdF Chimie, Paris, France

Filed Aug. 5, 1976, Ser. No. 711,820
Claims priority, application France, Aug. 5, 1975, 75 24406
Int. Cl.[2] B29C *25/00*
U.S. Cl. 264—340 11 Claims

1. A method for the accelerated transformation of the crystalline form of isotactic polybutene pipe, comprising moving the pipe linearly and subjecting the pipe while moving to a plurality of inwardly directed radial stresses simultaneously

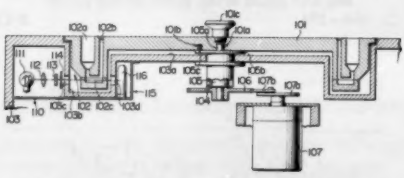


applied in at least two adjacent cross sections of the pipe and along at least one radius of each cross section.

4,141,954
REACTION TUBE ASSEMBLY FOR AUTOMATIC ANALYZER

Sadao Shigetomi, Sagamihara, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,801
Claims priority, application Japan, Nov. 2, 1976, 51-146851
Int. Cl.[2] G01N *21/24*
U.S. Cl. 422—64 5 Claims

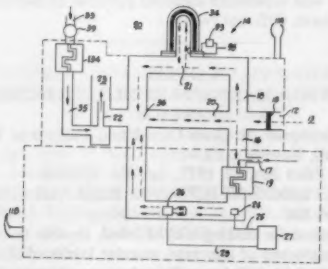


1. A reaction tube assembly for an automatic analyzer comprising a disc having a plurality of reaction tubes disposed along the periphery thereof, each reaction tube including a reaction chamber which is open at one end of the tube, the other end of the tube being formed as an air supply port with a hollow link providing a communication between the reaction chamber and the air supply port, the link being made transparent to serve as a flow cell.

4,141,955
COMBUSTIBLE CONCENTRATION ANALYZER

Joseph O. Obiaya, 4773 Walford, #13, Warrensville Heights, Ohio 44128

Filed Oct. 25, 1977, Ser. No. 845,050
Int. Cl.[2] G01N *27/16;* H01L *27/16*
U.S. Cl. 422—95 2 Claims



1. A combustible element analyzer comprising:

(a) a substrate base formed from an electrically insulating

material; said base including two configured opposite surfaces;

(b) a plurality of series connected thermocouples attached to a first surface of said base, said thermocouples forming a thermopile matrix;

(c) a plurality of catalyst material structures connected at spaced locations along said matrix to induce exothermic oxidation reactions at alternate junctions of said thermocouples among the components of a fluid sample thereby producing voltage differences along said matrix; said voltage differences adding in series to produce a total voltage signal larger than electrical noise within the thermopile, thereby enhancing the signal to noise ratio;

(d) means for electrically connecting the matrix to a monitor which will correlate matrix voltage to combustible gas concentration; and

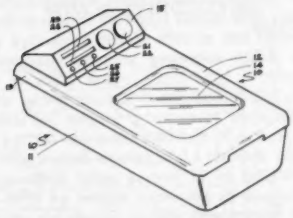
(e) a means for raising the ambient temperature of said matrix to a uniform value, said means attached to a second surface of said base material.

4,141,956

COLD STERILIZER

Marc S. Lemchen, 219 E. 81st St., New York, N.Y. 10028; Ian M. Chong, 17 Monroe Pl. #1A, Brooklyn Heights, N.Y. 11201, and Carlton Klein, 69-05C 186 La., Fresh Meadows, N.Y. 11365

Filed Feb. 13, 1978, Ser. No. 876,961
Int. Cl.² A61L *3/00*
U.S. Cl. 422—116 **3 Claims**



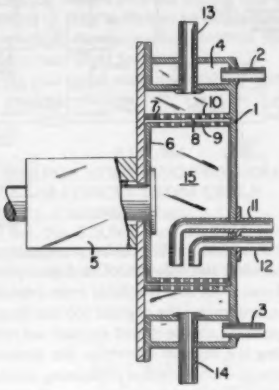
1. A cold sterilizer comprising a tray for containing sterilant and instruments to be sterilized, a lid fitting over the tray, a sterilization timer for measuring the period for which the instruments are to be contained in the sterilant to effect sterilization, means for resetting the timer to its original setting for a sterilization upon lifting the lid from the tray during the sterilization, means for locking the lid onto the tray and means operatively connecting the timer to the locking means so that the locking means is locked while the timer is timing a sterilization and the locking means unlocks when the period for which the timer is set has expired and means for manually overriding the timer and unlocking the locking means during a sterilization and for thereupon resetting the timer to its original setting for the sterilization.

4,141,957

APPARATUS FOR PRODUCING POLYMERS OF HIGH MOLECULAR WEIGHT BY THE TWO-PHASE INTERFACIAL METHOD

Otto Szabolcs, and Hans Schüller, both of Vienna, Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Division of Ser. No. 810,083, Jun. 27, 1977, Pat. No. 4,107,409. This application Apr. 24, 1978, Ser. No. 899,108
Claims priority, application Austria, Jun. 29, 1976, 476483/76
Int. Cl.² B01J *1/00*; C08F *2/00*
U.S. Cl. 422—135 **3 Claims**



1. An apparatus for producing polymers of high molecular weight by the two-phase interfacial method which comprises: (1) a hollowed-out antechamber, having a cylindrical side wall and a bottom, equipped with two entry passages for introduction of two liquid phases containing polymerizable reactants, said antechamber (a) being mounted on a rotating means so that it is rotatable and (b) having apertures in its side wall; (2) a stationary cylindrical wall, exterior to said side wall of the antechamber, having apertures which can be periodically brought into alignment with the apertures of the side wall of the antechamber by rotation of the latter, a space being present between said antechamber side wall and said exterior wall which is narrow in relation to the space inside the hollowed-out antechamber; (3) an outer casing entirely enclosing the antechamber and stationary cylindrical wall of (1) and (2), and forming an annular space with said stationary cylindrical wall; and (4) outlet means exterior to the cylindrical wall of (2) above and separated from it, said outlet means being mounted in the outer casing and providing reactant mixture discharge from the annular space.

4,141,958

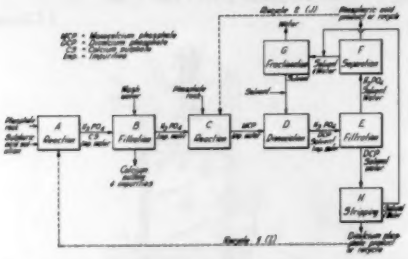
PROCESS FOR PRODUCING PHOSPHORIC ACID AND DICALCIUM PHOSPHATE

Grover L. Bridger, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation of Ser. No. 655,960, Feb. 6, 1976, abandoned, which is a continuation of Ser. No. 437,302, Jan. 28, 1974, abandoned. This application Sep. 26, 1977, Ser. No. 836,370
Int. Cl.² C01F *11/00*
U.S. Cl. 43—167 **13 Claims**

1. A process for producing phosphoric acid which comprises reacting aqueous sulfuric acid having from 50% to 100% by weight sulfuric acid with a recycled dicalcium phosphate material and with phosphatic raw material, selected from the group consisting of raw phosphate rock ore, phosphate rock concentrates, phosphatic by-products and phosphatic waste materials from phosphate rock beneficiation, to produce a mixture of phosphoric acid, calcium sulfate and impurities, separating the calcium sulfate and impurities therefrom to

leave phosphoric acid, impurities, and water, comingling the phosphoric acid, impurities and water with additional phosphatic raw material to form an aqueous slurry of monocalcium phosphate, reducing the water in said slurry to a content of from 0.3% to 20% by weight, treating said monocalcium phosphate thus produced with an organic solvent in which phosphoric acid is soluble and dicalcium phosphate is less soluble to effect dissociation of the monocalcium phosphate into phosphoric acid and an insoluble residue containing dicalcium phosphate, separating the solution of said phosphoric acid in the organic solvent from said insoluble resin containing dicalcium phosphate, separating the organic solvent from said phosphoric acid separating the occluded organic solvent from the residue, recycling the organic solvent to the dissociation step, and recycling the insoluble residue containing dicalcium phosphate to the initial step in the process as said recycled dicalcium phosphate material.



4,141,959

PROCESS FOR REMOVING NITROGEN OXIDES FROM COMBUSTION FLUE GAS

Akira Kato; Shinpei Matsuda; Shigeo Uno; Youichi Sakuta; Fumito Nakajima, all of Ibaraki, and Hiroshi Kagabu, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,491

Claims priority, application Japan, Nov. 19, 1976, 51-138507

Int. Cl.[2] B01D *53/34;* B01J *23/92*

U.S. Cl. 423—239 **5 Claims**

1. A catalytic process for removing NOx from combustion flue gas which contains SOx and oxygen comprising

(a) adding ammonia to said combustion flue gas

(b) contacting said combustion flue gas and ammonia with a catalyst at a temperature of between 150° and 330° C. to reduce NOx and to deposit ammonium sulfates on said catalyst,

(c) removing a part of said catalyst from the catalyst bed to a regeneration tower,

(d) heating the catalyst at a temperature between 350° and 600° C. to decompose said deposited ammonium sulfates to ammonia and sulfur trioxide,

(e) absorbing said sulfur trioxide on to a solid absorbent,

(f) adding ammonia formed from the decomposition of said ammonium sulfates to untreated combustion flue gas, and

(g) returning said catalyst treated at the regneration tower through a catalyst recirculation line to the catalyst bed.

4,141,960

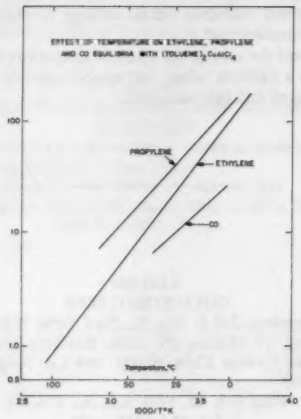
COMPLEX BIMETALLIC SALTS

Robert B. Long, Atlantic Highlands; Fred A. Caruso, Elizabeth, both of N.J.; Richard J. DeFeo, Baton Rouge, La., and David G. Walker, Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 557,494, Mar. 12, 1975, Pat. No. 4,066,679, which is a division of Ser. No. 144,302, May 17, 1971, Pat. No. 3,887,600, which is a division of Ser. No. 805,912, Sep. 3, 1968, Pat. No. 3,651,159. This application Oct. 6, 1977, Ser. No. 840,114

Int. Cl.[2] C01G *1/04*

U.S. Cl. 423—417 **4 Claims**



1. A complex bimetallic salt having the generic formula $CuAlX_4(CO)$ wherein X is selected from the group consisting of chlorine, bromine and fluorine atoms.

4,141,961

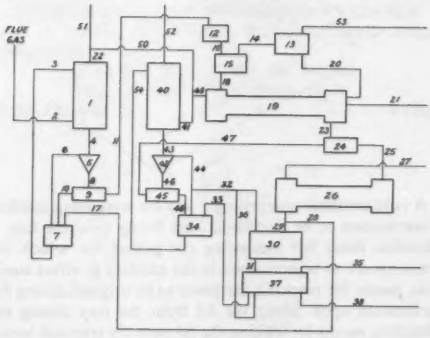
PRODUCTION OF H_2S FROM SO_2 OBTAINED FROM FLUE GAS

Ralph Miller, Pleasantville, N.Y., assignor to DTPM Corporation, Crompond, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,044

Int. Cl.[2] C01B *17/00, 17/16*

U.S. Cl. 423—563 **11 Claims**



1. The regenerable process for the removal, and its subsequent recovery as hydrogen sulfide, of the bulk of the sulfur dioxide contained in a flue gas, said process comprising the steps of:

(a) contacting said flue gas with an aqueous, alkaline, sodium-carbonate containing reaction medium essentially

saturated with sodium sulfite to react the bulk of the sulfur dioxide and a portion of the oxygen with the carbonate values to form a slurry of sodium sulfite and sodium sulfate dispersed in the reaction medium, the sodium and alkalinity being supplied to said reaction medium by the addition of recycled solid sodium carbonate from step (g);
(b) separating sodium sulfite and sodium sulfate crystals from the reaction medium;
(c) reducing the separated sodium sulfite and sodium sulfate crystals to solid sodium sulfide;
(d) forming an intimate blend consisting essentially of said solid sodium sulfide and the separated solid sodium bicarbonate of step (i);
(e) heating said blend in the substantial absence of air to a temperature sufficient to remove any water present in said blend and to react the sodium bicarbonate with the sodium sulfide in the blend to form gaseous hydrogen sulfide and dry, solid, anhydrous sodium carbonate;
(f) recovering the gaseous hydrogen sulfide;
(g) recycling at least part of the sodium carbonate formed in step (e) to step (a);
(h) adding the remainder of the sodium carbonate formed in step (e) to a sodium bicarbonate saturated solution and carbonating with carbon dioxide to form a slurry composed of solid particles of sodium bicarbonate dispersed in said solution, and;
(i) separating particles of sodium bicarbonate from the slurry formed in step (h) and recycling said separated solid particles of sodium bicarbonate to step (d).

4,141,962

CATALYSTS FOR TREATING GASES CONTAINING SULPHUR COMPOUNDS

Georges Dupuy, Fontenay-aux-Roses; Jean-Claude Daumas, Orsay, and Max Michel, Yerres, all of France, assignors to Rhone-Progil, France

Continuation of Ser. No. 615,721, Sep. 22, 1975, which is a division of Ser. No. 457,923, Apr. 4, 1974, abandoned. This application Oct. 5, 1977, Ser. No. 839,609
Claims priority, application France, Apr. 9, 1973, 73.12658
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—571 **4 Claims**

1. A process for catalytically recovering sulphur from a gas stream comprising hydrogen sulfide, sulfur dioxide, water vapor and carbon-sulphur compounds consisting essentially of carbon disulfide and/or carbonyl sulfide which comprises reacting carbon-sulphur compounds consisting essentially of carbon disulfide and/or carbonyl sulfide with water vapor to produce by hydrolysis carbon dioxide and hydrogen sulfide and simultaneously reacting hydrogen sulfide and sulphur dioxide to produce water vapor and elemental sulphur whereby the carbon-sulphur compounds are eliminated from the gas stream and sulphur is recovered therefrom, said reactions being carried out in the presence of a catalyst consisting essentially of activated alumina and a titanium compound, the titanium compound being present in an amount within the range of 1–60% by weight expressed as titanium oxide, the catalyst having the specific surface area greater than 80 m^2/g and the temperature of the reaction zone being such that the product gases at the conclusion of the reaction have a temperature ranging from 260°–335° C., and recovering the sulphur thus formed.

4,141,963

THERMAL DECOMPOSITION OF METAL NITRATES

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 748,596, Dec. 8, 1976, Pat. No. 4,100,263. This application May 16, 1977, Ser. No. 797,279
Int. Cl.[2] C01G *45/02*
U.S. Cl. 423—592 **15 Claims**

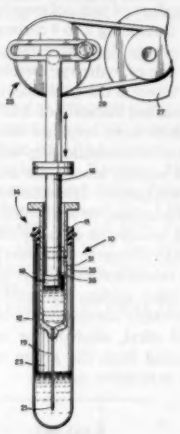
1. A method for thermally decomposing a metal nitrate in a liquid phase to the corresponding metal oxide and a nitrogen dioxide-containing gaseous mixture, said metal nitrate having a decomposition temperature of less than about 400° C., said process comprising the steps of
(1) introducing solid metal oxide particles coated with said metal nitrate liquid phase into a decomposition reactor, the metal of said oxide corresponding to the metal in the liquid phase;
(2) raising the temperature of said coated particles above the decomposition temperature of said nitrate;
(3) maintaining said coated patricles at a temperature above said decomposition temperature and in an atmosphere formed by the vapors evolved during said decomposition for a period of time sufficient to decompose said nitrate, the metal oxide decomposition product forming on and adhering to said particles; and
(4) removing said metal oxide and said nitrogen dioxide-containing gaseous mixture.

4,141,964

PROCESS FOR STRIPPING PHYSIOLOGICAL MATRICES FROM CELLS

Donald E. Henry, Cambridge, Mass.

Division of Ser. No. 373,967, Jun. 27, 1973, abandoned. This application Apr. 15, 1977, Ser. No. 787,927
Int. Cl.[2] G01N *1/00, 1/14*
U.S. Cl. 424—3 **13 Claims**



1. A process for forming a suspension of single cells with minimal damage to said cells from a sample of physiological substance in which said cells are held relatively immobile by a physiological matrix material, the steps comprising
(a) placing the sample in a compartment with a dispersion medium; and
(b) causing the sample to be repeatedly forced into and out of said compartment through an orifice until the desired dispersion is achieved.

4,141,965

ASSAY OF IMMUNE COMPLEXES

John F. Soothill, and Roland J. Levinsky, both of London, England, assignors to National Research Development Corporation, London, England

Filed Sep. 7, 1977, Ser. No. 831,349
Claims priority, application United Kingdom, Nov. 24, 1976, 48995/76
Int. Cl.[2] G01N *33/16*
U.S. Cl. 424—12 **14 Claims**

1. A method for the estimation of a human immune complex and analysis of a constituent thereof, comprising a latex particle agglutination test, in which a sample comprising human

physiological fluid is incubated with coated latex particles and IgM antibodies, wherein said latex particles are coated with said human complex constituent and said IgM antibodies are low affinity antibodies raised in a non-human animal against said human complex constituent.

4,141,966

METHOD OF INHIBITING SKIN IRRITATION

Sharon G. Willer, Loveland; Paul R. Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Cincinnati, Ohio

Division of Ser. No. 319,030, Dec. 27, 1972, Pat. No. 4,076,799. This application Jan. 20, 1978, Ser. No. 871,008

Int. Cl.[2] A61L *9/04*; A61K *31/74, 31/23, 31/19*

U.S. Cl. 424—45 **15 Claims**

1. A method of preventing or reducing irritation of the skin by skin irritating allergenic agents which comprises applying to the skin of a subject sensitized to said allergenic agent prior to contact with said skin irritating allergenic agent, an irritation reducing effective amount of a protective agent said agent comprising a compound containing at least two polar groups separated by a chain of at least 15 atoms the majority of which are carbon atoms selected from the group consising of

the unsaturated polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid or the saturated derivative product of said polymerized product or derivative product containing 2 to 4 carboxyl groups; or in place of carboxyl groups derivative radicals selected from the group consisting of hydroxyl; unsubstituted amino; substituted amino wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amino nitrogen; unsubstituted amido; substituted amido wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amido nitrogen; quaternary ammonium wherein the nitrogen substituents are alkyl of 1 to 6 carbon atoms; lower alkyl ester; sulfate; sulfonate; phosphate; phosphonate; and derivative compounds containing further substituents in said alkyl, aliphatic or aromatic hydrocarbon radicals selected from the group consisting of carboxyl and the said derivative radicals.

4,141,967

COSMETIC DEODORANT PREPARATIONS CONTAINING ALKANE DIPHOSPHONIC ACID ESTERS

Rainer Osberghaus, Dusseldorf-Urdenbach, and Helmut Blum, Dusseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

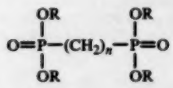
Filed Feb. 14, 1977, Ser. No. 768,489

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607225

Int. Cl.[2] A61K *7/32*

U.S. Cl. 424—47 **17 Claims**

1. A method of suppressing human body odor by applying to the areas of concentrated sweat glands a safe but deodorizing amount of a cosmetic preparation which contains 0.1 to 10% of an alkanediphosphonic acid ester of the general formula



in which R is a straight- or branched-chain alkyl radical having 1 to 6 carbon atoms and n is an integer of 1 to 6, and the remainder customary cosmetic constituents.

4,141,968

NOVEL SALTS OF 1,3-BIS-(β-ETHYLHEXYL)-5-AMINO-5-METHYL-HEXAHYDROPYRIMIDINE IN COMPOSITIONS HAVING BACTERIOSTATIC ACTIVITY

Wilhelm Kunz; Klaus Posselt, both of Wachtberg-Villiprott, and Manfred Lohner, Bonn-Bad Godesberg, all of Fed. Rep. of Germany, assignors to Doll GmbH, Bonn-Bad Godesberg, Fed. Rep. of Germany

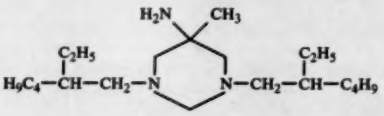
Filed Nov. 3, 1976, Ser. No. 738,510

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626935

Int. Cl.[2] A61K *9/68*; C07D *239/04*

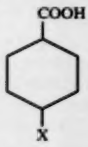
U.S. Cl. 424—48 **12 Claims**

1. The method of treating the mouth cavity for inhibiting the growth of microorganisms therein which comprises applying thereto an effective amount of a composition containing at least one salt of 1,3-bis-(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine of the general formula



I

with an aromatic carboxylic acid of the general formula



II

wherein X is a member selected from the group consisting of —COOH, —OH, $-NH_2$, $-SO_3H$ and $-SO_2NH_2$, as active ingredient together with at least one member selected from the group consisting of conventional diluents and carrier materials.

4,141,969

DENTIFRICES CONTAINING AMORPHOUS SILICA

Robert L. Mitchell, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,344

Int. Cl.[2] A61K *7/18*; B65D *85/14, 81/24, 81/26*

U.S. Cl. 424—52 **11 Claims**

1. A dental cream composition compatible with the surface of an unlined aluminum container and contained in said container, comprising a dental vehicle and dispersed therein about 10–35% by weight of a polishing agent consisting essentially of synthetic precipitated silica essentially free of alumina which silica has a wet cake moisture content of less than about 75%, an oil absorption of less than about 125 cc/gm, a pack density of more than about 12 pounds/cubic foot, a valley abrasion of more than about 5.0 mg wire loss, a surface area of less than about 120m^2/gm, an aggregate particle size of about 2 to 20 microns and an essentially amorphous x-ray structure, a compound which provides fluorine in amount of about 0.01 to 1% by weight and a water-soluble calcium salt selected from the group consisting of chloride, bromide, iodide, acetate and nitrate in amount to provide at least about 0.01% to about 0.3% by weight of calcium ion in water, said dental cream otherwise being substantially calcium free and causing formation of gas pockets on an aluminum container surface, air on wall and substantially etching and swelling of the container when the amount of the calcium salt is such that less than about 0.01% calcium ion is solubilized in water and compatibility with said aluminum container being substantially lost at substantially higher amount of calcium than about 0.3% by weight of calcium ion in water.

4,141,970

METHOD FOR ENHANCING THE RESISTANCE OF NEW BORN MAMMALIAN YOUNG TO GASTRO-INTESTINAL INFECTIONS

John W. Chidlow, and Philip Porter, both of Bedford, England, assignors to Internationale Octrooimaatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 785,550, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 684,368, May 7, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,303

Claims priority, application United Kingdom, May 7, 1975, 19161/75

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 8 Claims

1. A method of treating a pregnant mammal whose young acquire, via the colostrum and gastro-intestinal wall, at least part of their passive immunity to gastro-intestinal disorders caused by infection with pathogenic bacteria, in which method effective amounts of endotoxins of one or more pathogenic bacteria strains, substantially free from the living pathogenic organisms, are administered both orally and parenterally to the mammal, said oral administration being carried out repeatedly during the gestation period, and said parenteral administration being carried out at least once towards the end of the gestation period to ensure high antibody activity during the period of colostrum formation.

4,141,971

DERIVATIVES OF MIDECAMYCINE

Francois Krausz, and Alain Calvet, both of Montpellier, France, assignors to C M Industries, Paris, France

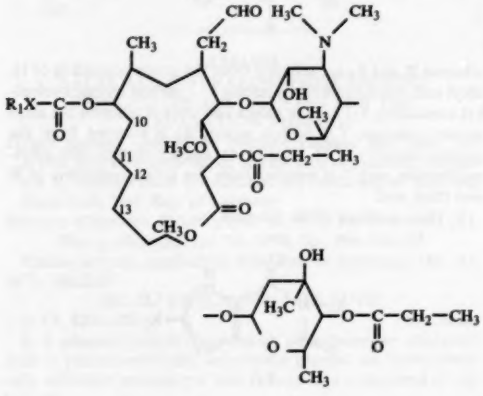
Filed Jun. 30, 1976, Ser. No. 701,291

Claims priority, application France, Jul. 8, 1975, 75 21432

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 17 Claims

1. Compounds represented by the formula:

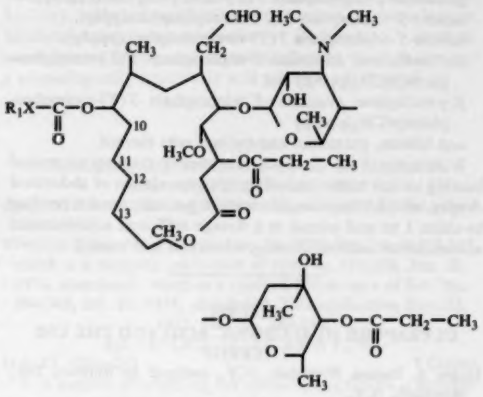


in which

X is selected from the class of oxygen and sulphur,

R_1 is selected from the group consisting of alkyl of 1 to 5 carbons, isobutyl, allyl and phenyl, the broken lines indicating the optional presence of double bonds with the proviso that the two double bonds in the 10, 11 position on the one hand and 12, 13 on the other, exist simultaneously or neither of them exists.

15. An antibiotic medicament comprising, as its active ingredient, an antiobiotic effective concentration of the compound represented by the formula:



in which X is selected from the class of oxygen and sulphur. R^1 is selected from the group consisting of alkyl of 1 to 5 carbons, isobutyl, allyl and phenyl and R_2 is selected from the group consisting of hydrogen and acetyl, the broken lines indicating the optional presence of double bonds with the proviso that the two double bonds, in the 10, 11 position on the one hand and 12, 13 on the other, exist simultaneously or neither of them exists.

4,141,972

PURINE NUCLEOSIDE 5'-PHOSPHATE (MONO, DI OR TRI) 3'(2')-DIPHOSPHATES AND PROCESSES FOR THEIR PREPARATION

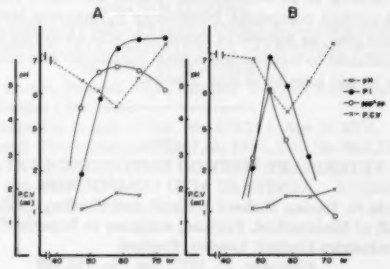
Toyokazu Nishino, Hikisokita; Yasutaro Hamagishi, Sakai; Toshikazu Oki, Kamakura, and Sawao Murao, Sakai, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Division of Ser. No. 559,462, Mar. 18, 1975, Pat. No. 4,059,487. This application Apr. 27, 1977, Ser. No. 791,276

Claims priority, application Japan, Mar. 29, 1974, 49-34625; Dec. 16, 1974, 49-143546

Int. Cl.[2] A61K *31/70*; C07H *19/20*

U.S. Cl. 424—180 5 Claims



1. A purine nucleoside 5'-(mono, di or tri) phosphate 3'(2')-diphosphate and the corresponding purine nucleoside 5'-(di or tri) phosphate 3'(2')-monophosphate and the salts thereof selected from the group consisting of

adenosine-5'-monophosphate 3'(2')-diphosphate(pApp),

adenosine-5'-diphosphate 3'(2')-diphosphate(ppApp),

adenosine-5'-triphosphate 3'(2')-diphosphate(pppApp),

guanosine-5'-monophosphate 3'(2')-diphosphate(pGpp),

inosine-5'-monophosphate 3'(2')-diphosphate(pIpp),

inosine-5'-diphosphate 3'(2')-diphosphate(ppIpp),

inosine-5'-triphosphate 3'(2')-diphosphate(pppIpp),

β,γ-methylene adenosine 5'-triphosphate 3'(2')-diphosphate(p(CH_2)ppApp),

guanosine-5'-triphosphate 3'(2')-monophosphate(pppGp),
inosine-5'-diphosphate 3'(2')-monophosphate(ppIp),
inosine-5'-triphosphate 3'(2')-monophosphate(pppIp),
β,γ-methylene adenosine-5'-triphosphate 3'(2')-monophosphate(p(CH_2)ppAp) and
β,γ-methylene guanosine-5'-triphosphate 3'(2')-monophosphate(p(CH_2)ppGp)
and lithium, potassium and sodium salts thereof.

3. A method for chemotherapeutically treating an animal bearing ascites tumor including an accumulation of abdominal dropsy, which comprises administering a compound according to claim 1 to said animal in a dosage sufficient to lower said accumulation without causing toxicity to said animal.

4,141,973

ULTRAPURE HYALURONIC ACID AND THE USE THEREOF

Endre A. Balazs, Riverdale, N.Y., assignor to Biotrics, Inc., Riverdale, N.Y.

Continuation of Ser. No. 623,333, Oct. 17, 1975, abandoned.
This application Oct. 25, 1977, Ser. No. 844,833
Int. Cl.[2] A61K *31/70*; C07G *3/00*
U.S. Cl. 424—180 **11 Claims**

1. A sterile, pyrogen-free, protein-free, non-antigenic, hyaluronic acid fraction having an average molecular weight of at least about 750,000, a protein content of less than 0.5% by weight, ultraviolet light absorbance of a 1% solution of the sodium salt thereof of less than 3.0 at 257 nanometers wavelength and less than 2.0 at 280 nanometers wavelength, a kinematic viscosity of a 1% solution of the sodium salt thereof in physiological buffer of greater than about 1000 centistokes and a molar optical rotation of a 0.1–0.2% solution of the sodium salt thereof in physiological buffer of less than $-11 = 10^3$ degree — cm^2/mole (of disaccharide) measured at 220 nonometers; and which is characterized by infiltration by no more than about 200 white blood cells per mm^3 of aqueous humor of the owl monkey eye when one milliliter of a 1% solution of the sodium salt of said fraction dissolved in physiological buffer is implanted in the vitreous replacing about one-half the existing liquid vitreous.

4. A method of improving pathological joint function in an animal by relieving pain, reducing inflammation and effecting the healing of an intraarticular wound associated therewith, said method comprising introducing by injection into an affected joint, an amount of hyaluronic acid according to claim 1, sufficient to increase the normal hyaluronic acid concentration in said joint by at least 5 times.

4,141,974

VETERINARY METHOD EMPLOYING CERTAIN AUREOLIC ACID COMPOUNDS

David H. Davies; Richard J. Ernill, and Geoffrey L. F. Norris, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 27, 1977, Ser. No. 791,189
Claims priority, application United Kingdom, May 19, 1976, 20675/76
Int. Cl.[2] A61K *31/71*
U.S. Cl. 424—181 **6 Claims**

1. A method for improving the growth rate of meat-producing domestic animals or for improving the efficiency of the utilization of animal foodstuffs by said animals which comprises orally administering to an animal, in need of said improvement an effective amount of a member of the aureolic acid group selected from (1) mithramycins A, B, or C; (2) aburamycins A, B, C, or D; (3) olivomycins A, B, C, or D; (4) variamycin; or (5) the ammonium, alkali metal, alkaline earth metal and transition metal salts, complexes and chelates of one of (1)-(4) or mixtures thereof.

4,141,975

EQUINE PARASITICIDE PASTE

John C. Gay, St. Joseph, Mo., and William P. Marsland, Spring Hill, Kans., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Nov. 3, 1977, Ser. No. 848,257
Int. Cl.[2] A61K *31/66*
U.S. Cl. 424—217 **9 Claims**

1. An equine parasiticide paste comprising a boticidally and anthelmintically effective amount of particles of trichlorfon dispersed in an inert mineral oil carrier, the composition having a paste-like consistency such that, when introduced into the mouth of a horse, at least a portion of the composition is adapted to adhere to the palate and inner portions of the mouth of the horse.

4,141,976

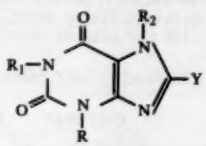
PROCESS FOR ALLEVIATING PROLIFERATIVE SKIN DISEASES

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jun. 21, 1977, Ser. No. 808,473
Int. Cl.[2] A61K *31/56*, *31/52*
U.S. Cl. 424—240 **4 Claims**

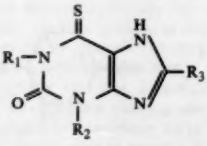
1. A process for alleviating proliferative skin diseases which comprises administering to the afflicted human or animal a composition containing as its active component at least one of the compounds selected from the groups consisting of:

1. Xanthines of the formula



wherein R and R_1 are selected from the group consisting of H, alkyl and hydroxyalkyl containing 1–7 carbon atoms, cycloalkyl containing 3–7 carbon atoms and aralkyl wherein the alkyl portion contains 1–7 carbon atoms, R_2 is selected from the group consisting of H, alkyl (1–4), and a complex with ethylenediamine, and Y is selected from the group consisting of H and thiol; and

2. Thioxanthines of the formula



wherein R_1 is selected from the group consisting of methyl, ethyl, propyl and $-CH_2-CH=CH_2$; R_2 is selected from the group consisting of methyl, ethyl, propyl, $-CH_2CH=CH_2$, isopropyl, isobutyl, $CH_2CCH_3=CH_2$, pentyl, 3-methoxy-propyl, 2-methyl-butyl, hexyl, benzyl, phenyl, phenethyl, and furfuryl; R_3 is selected from the group consisting of hydrogen, methyl and ethyl;

said compounds being in association with a pharmaceutical carrier wherein said active component is present in an amount in the range of about 0.1 to about 15% w/v which is effective to alleviate a proliferative skin disease.

4,141,977

TREATMENT OF PSORIASIS WITH 6-SUBSTITUTED NICOTINAMIDES, 2-SUBSTITUTED PYRAZINAMIDES AND CLOSELY RELATED COMPOUNDS

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 601,411, Aug. 4, 1975, Pat. No. 4,067,975. This application Aug. 17, 1976, Ser. No. 715,131
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] A61K *31/455, 31/495*
U.S. Cl. 424—250 21 Claims

1. A method for alleviating the symptoms of psoriasis in humans suffering therefrom comprising:

applying, topically, to involved areas of the human body an effective amount of a composition containing at least one member selected from the group consisting of:

(1) 6-Aminonicotinic acid;
(2) 6-Aminonicotinic acid methyl ester;
(3) 6-Aminonicotinic acid ethyl ester;
(4) 6-Aminonicotinic acid tert-butyl ester;
(5) 6-Aminonicotinic acid nicotinic ester;
(6) 6-Aminonicotinaldehyde;
(7) 6-Hydroxynicotinic acid;
(8) 6-Methylaminonicotinamide;
(9) 6-Dimethylaminonicotinamide;
(10) 6-Formylaminonicotinamide;
(11) 6-Hydrazinonicotinamide;
(12) 6-Ethylaminonicotinamide;
(13) 6-Hydrazinonicotinic acid ethyl ester;
(14) 6-Chloronicotinamide;
(15) 6-Carbamoylnicotinamide;
(16) 6-Aminothionicotinamide;
(17) 6-Aminonicotinonitrile;
(18) 6-Aminonicotinamide-1-oxide;
(19) 2-Aminopyrazinamide;
(20) 2-Carbamoylpyrazinamide;
(21) 6-Nicotinalaminonicotinamide; and
(22) 6-Aminonicotinhydrazide

in a concentration from about 0.01 to 5% by weight of the total composition, in a pharmaceutically acceptable carrier.

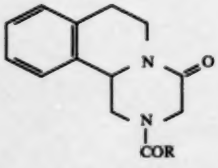
4,141,978

2-ACYL-4-OXO-PYRAZINO-ISOQUINOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Jürgen Seubert, Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 533,467, Dec. 16, 1974, Pat. No. 4,001,211. This application Nov. 15, 1976, Ser. No. 742,133
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1973, 2362539
Int. Cl.[2] C07D *241/36;* A61K *31/495*
U.S. Cl. 424—250 16 Claims

1. A pharmaceutical composition comprising, in admixture with a pharmaceutically acceptable carrier, an anthelmintically effective amount per unit dosage of a compound of the formula



wherein R is phenyl mono-substituted in the o-position by fluorine or in the m- or p-position by fluorine, chlorine, nitro, hydroxy, amino, formylamino, acetylamino, pentanoylamino, hexanoylamino, octanoylamino, oleoylamino, methoxyacetylamino, methylamino, dimethylamino or allylamino, or a physiologically acceptable acid addition salt thereof.

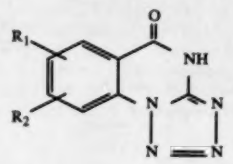
4,141,979

TETRAZOLO[A]QUINAZOL-5-ONES ANTIALLERGY AND ANTIULCER AGENTS

Jasjit S. Bindra, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 753,856, Dec. 23, 1976, Pat. No. 4,085,213, which is a continuation-in-part of Ser. No. 653,250, Jan. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 594,765, Jul. 10, 1975, abandoned. This application Dec. 22, 1977, Ser. No. 863,519
Int. Cl.[2] C07D *487/04;* A61K *31/41*
U.S. Cl. 424—251 7 Claims

1. A method of inhibiting the release of mediators of anaphylaxis in a mammalian subject which comprises administering orally, intranasally, parenterally or by inhalation to the subject an anaphylaxis mediator release inhibiting amount of a compound having the formula



wherein each of R_1 and R_2 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, alkanoyloxy having from one to four carbon atoms, benzyloxy, hydroxy, trifluoromethyl, sulfonamido and halo; and R_1 and R_2 when taken together are alkylenedioxy and are selected from the group consisting of methylenedioxy and ethylenedioxy.

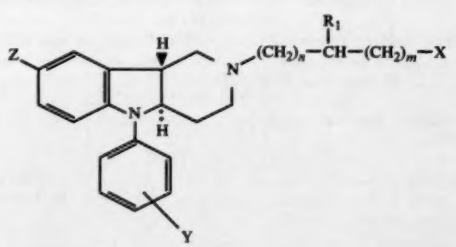
4,141,980

TRANQUILIZING TRANS-HEXAHYDRO-PYRIDO-INDOLE-2-ALKANOLS, -ALKANONES, -ALKANONITRILES, -ALKANOIC ACIDS, ESTERS AND AMIDES

Joel G. Berger, Summit, N.J., assignor to Endo Laboratories Inc., Garden City, N.Y.

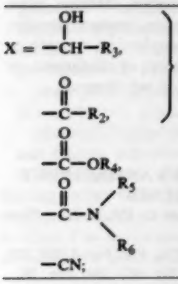
Continuation-in-part of Ser. No. 675,112, Apr. 8, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,212
Int. Cl.[2] A61K *31/445;* C07D *471/04*
U.S. Cl. 424—256 52 Claims

1. A compound of the formula:



wherein

Z = H, F, Cl, or Br;
Y = H, F, Cl, Br, or OCH_3;


X = —CH—R3,
OH
R2 and R3 independently = H, CH3, C2H5 or C3—C6 cycloalkyl;
—C—R2,
R4 = H, CH3, or C2H5;
—C—OR4,
R5 and R6 independently = H, CH3, or C2H5, or R5 + R6, taken together = —(CH2)p—, and p = 4, 5; or
—C—N
R6
—CN;

R_1 = H, CH_3, or C_2H_5;
and
m and n, independently, = 0–4;
provided that than when m + n = 0, $R_1 \neq C_2H_5$, and acid addition salts thereof with pharmaceutically suitable acids.

2. A compound of claim 1 in which m + n = 0–4.

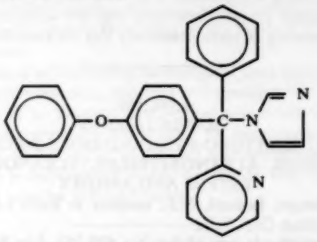
19. A tranquilizing composition comprising a pharmaceutically suitable carrier and an effective tranquilizing amount of a compound of claim 2.

4,141,981
ANTIMICROBIAL AGENT

Wilfried Draber; Manfred Plempel; Karl H. Büchel, and Erik Regel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 813,055
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630252; Mar. 8, 1977, 2709964
Int. Cl.[2] A61K *31/44*
U.S. Cl. 424—263 6 Claims

1. A method of treating a spore-forming mycotic infection in humans and animals which comprises topically applying to the skin of said human or animal in need of said treatment a topical composition comprising a sporicidally effective amount of a compound of the formula:



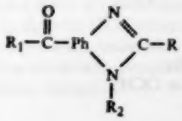
in combination with a pharmaceutically acceptable carrier suitable for topical application and in a concentration of about 0.1 to 5% active ingredient.

4,141,982
BENZ-ACYLBENZIMIDAZOLE-2-CARBOXYLIC ACID DERIVATIVES

Ernst Habicht, Oberwil; Pier G. Ferrini, Binningen, and Alfred Sallmann, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,630
Claims priority, application Luxembourg, Aug. 27, 1976, 75684
Int. Cl.[2] A61K *31/415*; C07D *235/16*
U.S. Cl. 424—267 9 Claims

1. A benz-acyl-benzimidazole-2-carboxylic acid derivative of the formula:



(I)

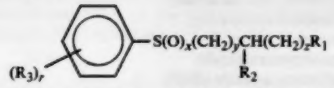
in which R is carboxyl, esterified carboxyl containing, as the etherified hydroxyl group, lower alkoxy, hydroxy-lower alkoxy, lower alkoxy-lower alkoxy or di-lower alkylamino-lower alkoxy or amidated carboxyl containing, as the amino group, amino, hydroxyamino, lower alkylamino, di-lower alkylamino or lowr alkyleneamino, lower alkylamino, di-lower alkylamino or lowr alkyleneamino, R_1 is lower alkyl, which is unsubstituted or substituted by lower alkoxy, lower alkylthio, lower alkylsulphinyl, lower alkylsulphonyl, phenylthio, phenylsulphinyl or phenylsulphonyl, lower aklenyl or cycloalkyl having from 3 to 8 carbon atoms, or phenyl or phenyl-lower aklyl which are unsubstituted or substituted in the phenyl radical by lower alkyl, lower alkoxy or halogen, R_2 is hydrogen or lower alkyl and Ph is 1,2-phenylene which contains the radical of the formula R_1—C(=O)— and is otherwise unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy and/or halogen, or a pharmaceutically acceptable sale thereof.

4,141,983
METHOD FOR INHIBITING ADP-INDUCED PLATELET AGGREGATION USING PHENYLTHIOALKYLAMINES

Joseph E. Dunbar; Louis E. Begin; Robert J. Broesma, and George D. Dickerson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 714,950, Aug. 16, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,124
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 4 Claims

1. A method for inhibiting ADP-induced platelet aggregation and treating thrombosis in a mammal in need thereof comprising administering internally to said mammal a platelet aggregation inhibiting amount of a compound corresponding to the formula:



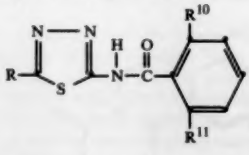
and the pharmaceutically-acceptable salts thereof wherein:
R_1 is piperidino;
R_2 is lower alkyl or hydrogen;
R_3 is, lower alkyl, halo, hydroxy, amino, acetamino, acetoxy, lower alkoxy, or carboxy;
r is an integer of from 0 to 5;
x is an integer of from 0 to 2;
y is an integer of from 0 to 4 with the proviso that when R_2 is lower alkyl, *y* is 1; and
z is an integer of from 0 to 3 with the proviso that when R_2 is hydrogen *z* is 0.

4,141,984
N-(1,3,4-THIADIAZOL-2-YL)BENZAMIDES

John S. Ward, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

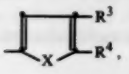
Continuation-in-part of Ser. No. 740,166, Nov. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 656,552, Feb. 9, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,687
Int. Cl.[2] A01N *9/12*; C07D *285/12, 417/04*
U.S. Cl. 424—270 62 Claims

1. A compound of the formula

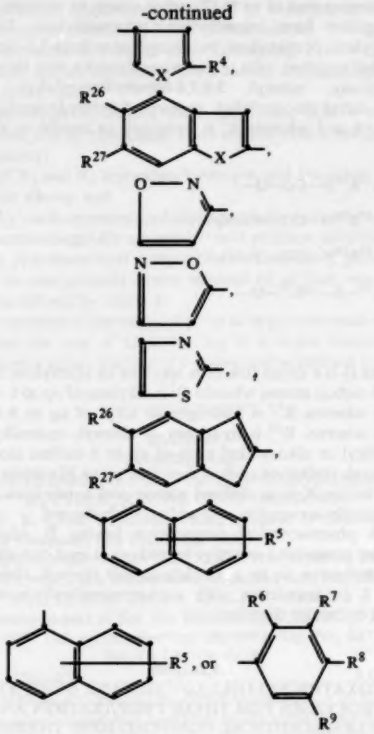


(I)

wherein R represents



-continued



wherein

X represents oxygen or sulfur;

R^3 and R^4 independently represent hydrogen, chloro, bromo or methyl, provided that R^3 represents hydrogen when X represents oxygen;

R^5 represents hydrogen, chloro, bromo, fluoro or trifluoromethyl;

one of R^{26} and R^{27} represents hydrogen and the other of R^{26} and R^{27} represents hydrogen, fluoro, chloro, bromo, trifluoromethyl or methoxy;

and either

(1) R^6 and R^7 represent hydrogen, one of R^8 and R^9 represents hydrogen, and the other of R^8 and R^9 represents hydrogen, acetamido, chloro, methoxy, bromo, iodo, fluoro, trifluoromethyl, methyl, hydroxy, phenyl, or phenyl monosubstituted with bromo, chloro or fluoro, or

(2) R^6 and R^7 represent hydrogen, and R^8 and R^9 independently represent chloro, fluoro or bromo, or

(3) R^6 and R^8 represent hydrogen, and R^7 and R^9 independently represent chloro, fluoro, bromo or trifluoromethyl, or

(4) R^7 and R^9 represent hydrogen, and R^6 and R^8 independently represent chloro, fluoro or bromo, or

(5) R^7, R^8 and R^9 represent hydrogen, and R^6 represents chloro, fluoro or bromo, or

(6) R^6, R^7 and R^9 represent hydrogen, and R^8 represents nitro, amino or cyano, or

(7) R^6 and R^7 represent hydrogen, one of R^8 and R^9 represents hydrogen and the other of R^8 and R^9 represents C_1–C_2 alkoxy substituted with one or more fluorine atoms;

R^{10} and R^{11} independently represent hydrogen, chloro, fluoro, bromo, methyl or methoxy;

provided that:

(1) one of R^{10} and R^{11} may represent hydrogen, if and only if the other represents methoxy;

(2) at least one of R^{10} and R^{11} must represent methyl or methoxy, unless

(a) R^8 does not represent hydrogen, and R^6, R^7 and R^9 represent hydrogen, or

(b) R^6 and R^8 represent hydrogen, and one or both of R^7 and R^9 represent trifluoromethyl;

(3) neither R^8 nor R^9 represents phenyl, acetamido, methoxy, nitro, amino, cyano or substituted phenyl unless both R^{10} and R^{11} represent methoxy;

(4) two of R^7, R^8 and R^9 represent hydrogen unless both R^{10} and R^{11} represent methyl or methoxy;

(5) both R^{10} and R^{11} represent methoxy or methyl when R represents naphthyl, furyl or thienyl;

(6) both R^{10} and R^{11} represent methoxy when R represents benzothienyl, benzofuryl, isoxazolyl or thiazolyl.

4,141,985

ALLEVIATION OF MINIMAL BRAIN DYSFUNCTION WITH 2-[(3,4-DICHLOROPHENOXY)METHYL]-2-IMIDAZOLINE

Carl S. Strande, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 730,546, Oct. 7, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,911

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 R **3 Claims**

1. A method for alleviating Minimal Brain Dysfunction in children comprising administering internally to a child suffering from Minimal Brain Dysfunction an amount of an imidazoline compound effective to alleviate said condition, the imidazoline compound being selected from the group consisting of 2-[(3,4-dichlorophenoxy)-methyl]-2-imidazoline and a pharmaceutically-acceptable salt thereof.

4,141,986

ANTIBIOTICS $890A_2$ AND $890A_5$

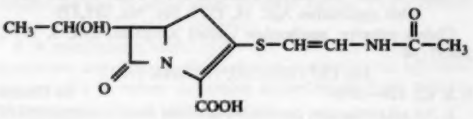
Patrick J. Cassidy, Rahway; Robert T. Goegelman, Linden; Edward O. Stapley, Metuchen, all of N.J., and Sebastian Hernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 680,831, Apr. 28, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 823,258

Int. Cl.² C07D *487/04;* **A61K** *31/40*

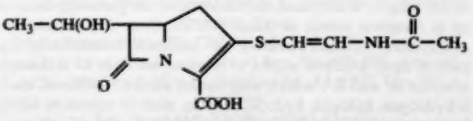
U.S. Cl. 424—274 **6 Claims**

1. The compound having the structure:



wherein said compound has 100 MHz nuclear magnetic resonance signals having chemical shifts in parts per million and multiplicities indicated as: 1.33 (d, J = 6, $\underline{C}H_3$—CH); 2.07 (S, $C\underline{H}_3C$=O); 3.15 (m, C—$C\underline{H}_2$—C); 3.69 (m, >$C\underline{H}$—C=O); ~4.3 (>CHN and >CH—OH), 6.09 and 7.12 (doublets, J = 13.5, S—$C\underline{H}$=$C\underline{H}$—N); and the pharmaceutically acceptable salts thereof.

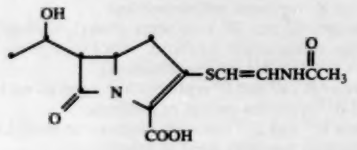
2. The compound having the structure:



wherein said compound has 100 MHz nuclear magnetic resonance signals having chemical shifts in parts per million and

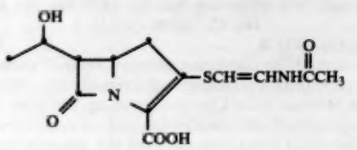
multiplicities indicated as: 1.29 (d, J = 6.2, $C\underline{H}_3$—CH); 2.05 (S, $C\underline{H}_3C$=O); 3.09 (d of d C—$C\underline{H}_2$—C); 3.41 (d of d, J = 5.0, 3.0 >$C\underline{H}$—C=O); 4.16 (m, >$C\underline{H}$—N and >$C\underline{H}$—OH); 6.00 and 7.11 (doublets, J = 13.8, S—$C\underline{H}$=$C\underline{H}$—N); and the pharmaceutically acceptable salts thereof.

4. A composition comprising an antibacterial effective amount of the compound having the structure:



wherein said compound has 100 MHz nuclear magnetic resonance signals having chemical shifts in parts per million and multiplicities indicated as: 1.33 (d, J = 6, CH_3—CH); 2.07 (S, CH_3C=O); 3.15 (m, C—CH_2—C); 3.69 (m, >CH—C=O); ~4.3 (>CHN and >CH—OH), 6.09 and 7.12 (doublets, J = 13.5, S—CH=CH—N) and pharmaceutically acceptable salts thereof and a non-toxic pharmaceutically acceptable carrier therefore.

5. A composition comprising an antibacterial effective amount of the compound having the structure:



wherein said compound has 100 MHz nuclear magnetic resonance signals having chemical shifts in parts per million and multiplicities indicated as: 1.29 (d, J = 6.2, CH_3—CH); 2.05 (S, CH_3C=O); 3.09 (d of d C—CH_2—C); 3.41 (d of d, J = 5.0, 3.0 >CH—C=O); 4.16 (m, >CH—N and >CH—OH); 6.00 and 7.11 (doublets, J = 13.8, S—CH=CH—N).

4,141,987

1-ARYLOXY-3-THENAMIDOALKYLAMINO-2-PROPANOL DERIVATIVES

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

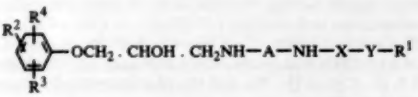
Division of Ser. No. 582,883, Jun. 2, 1975, Pat. No. 4,034,106. This application Apr. 14, 1977, Ser. No. 787,375

Claims priority, application United Kingdom, Jun. 5, 1974, 24837/74

Int. Cl.[2] **C07D** *333/10;* **A61K** *31/38*

U.S. Cl. 424—275 **10 Claims**

1. An alkanolamine derivative selected from a compound of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms; wherein X is carbonyl (—CO—) or sulphonyl ($—SO_2—$); wherein Y is a direct link, or is alkylene, oxyalkylene or alkyleneoxy each of up to 6 carbon atoms, or imino (—NH—), or alkylimino, iminoalkylene, iminoalkyleneoxy or iminoalkylenecarbonyloxy each of up to 6 carbon atoms, or oxygen; wherein R^1 is thienyl; wherein R^2 and R^3, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, hydroxymethyl, 1-hydroxyethyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form, respectively, indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8,-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; and wherein R^4 is hydrogen or amidic or the formula:

$R^{15}R^{16}N—CO—Q—$

$R^{15}R^{16}N—CO—NH—Q—$

$R^{15}R^{16}N—CO—Q^1—O—$

$R^{16}—X—NR^{15}—Q—$

or

wherein Q is a direct link or is alkylene or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; and wherein X is as defined above; and a non-toxic, pharmaceutically-acceptable acid-addition salt thereof.

7. A pharmaceutical composition having B. adrenergic blocking comprising as active ingredient at least one alkanolamine derivative or an acid-addition salt thereof, claimed in claim 1, in association with a pharmaceutically-acceptable diluent or carrier therefor.

4,141,988

2,9-DIOXATRICYCLO[4,3,1,$0^{3,7}$]DECANE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

Peter W. Thies; Samuel David, both of Hannover, Fed. Rep. of Germany; Hartmut Hauth, Riehen, and Dietmar Roemer, Allschwil, both of Switzerland, assignors to Kali-Chemie Pharma GmbH, Hannover, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,626

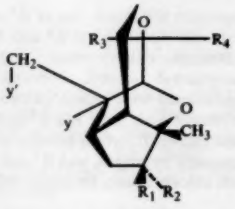
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704621

Int. Cl.[2] **A61K** *31/335;* **C07D** *319/08*

U.S. Cl. 424—278 **25 Claims**

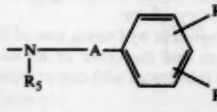
1. A compound selected from the group of 2,9-dioxatricyclo [4,3,1,$0^{3,7}$]decanes of the formula I

(I)



wherein

one of R_1 and R_2 represents hydrogen and the other represents an amino group having the formula



wherein R_5 represents hydrogen, alkyl containing 1 to 6 carbon atoms or an alkenyl group containing 2 to 6 carbon atoms

A represents alkylene containing 2 to 4 carbon atoms, or alkenylene containing 2 or 4 carbon atoms;

R_6 represents hydrogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 3 carbon atoms, halogen, or hydroxy; and

R_7 represents hydrogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 3 carbon atoms, halogen, or hydroxy;

one of R_3 and R_4 represents hydrogen and the other represents alkoxy; and

y and y' each represent hydrogen or jointly form a bond, and pharmacologically acceptable acid addition salts thereof.

22. A pharmaceutical composition for inhibiting pain comprising an analgesically active amount of at least one compound as defined by claim 1.

24. A method of treatment of pains in larger mammals which comprises the step of administering to a larger mammal an analgesically active amount of a compound as defined in claim 1.

4,141,989
FUNGICIDAL 3-(N-CHLOROACETYL-N-ARYLAMINO)-GAMMA-BUTYROLACTONE COMPOSITIONS

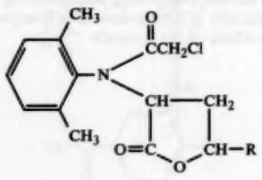
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 731,491, Oct. 12, 1976, Pat. No. 4,107,323, which is a continuation-in-part of Ser. No. 631,351, Nov. 12, 1975, Pat. No. 4,012,519, which is a continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Sep. 29, 1977, Ser. No. 837,121

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—279 3 Claims

1. A method for controlling *Phytophthora* crown or root rot diseases which comprises applying to the growth medium of plants or plant hosts of *Phytophthora* fungi a fungicidally effective amount of a compound of the formula.



wherein R is hydrogen or methyl.

4,141,990
ANTI-MICROBIAL ALKYL SUBSTITUTED-2-NITRO-3-PHENYLBENZOFURANS

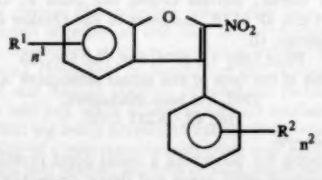
Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Feb. 26, 1974, Ser. No. 445,976

Int. Cl.[2] A61L *9/00;* C07D *307/82*

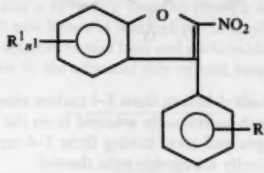
U.S. Cl. 424—285 13 Claims

1. A compound of the formula



wherein R^1 and R^2 are each alkyl groups containing from one to four carbon atoms and n^1 and n^2 are each 0–2, provided that the sum of n^1 and n^2 is 2.

6. An antimicrobial composition comprising an antimicrobially effective amount of a compound of the formula



wherein R^1 and R^2 are each alkyl groups containing from 1 to 4 carbon atoms and n^1 and n^2 are each 0–3, provided that the sum of n^1 and n^2 is 1–5, dispersed in a pharmaceutically acceptable extending medium.

4,141,991
FERROCENE DERIVATIVES

Rudolf Lattrell; Heinrich Kief, both of Königstein, Taunus, and Hermann Bähr, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

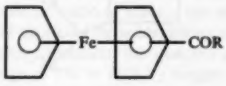
Filed May 24, 1977, Ser. No. 799,972

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623487

Int. Cl.[2] A01N *9/00;* A61K *31/295;* A61L *13/00*

U.S. Cl. 424—295 7 Claims

1. Compounds of the formula I



I

in which R represents a cycloalkenyl radical having 5 to 7 carbon atoms in which the ethylenic double bond is not in an adjacent position to the CO-group, or a cycloalkenyl radical having 5 to 7 carbon atoms in which the ethylenic double bond is not in an adjacent position to the CO-group and which is substituted one or more times by alkyl having 1 to 4 carbon atoms, phenyl, benzyl or chlorine.

6. A medicament useful in the oral treatment of sideropenia symptoms and sideropenic anaemiae containing an effective amount of a ferrocene derivative according to claim 1 and a pharmaceutically acceptable carrier.

4,141,992
CYCLOALKYLCARBOXYAMIDINES AND HALOBENZAMIDINES AS ANTI-AMEBIC AGENTS

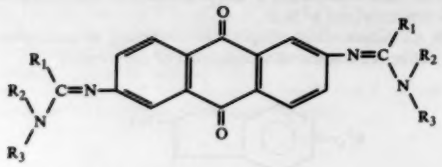
Stanley A. Lang, Jr., Stony Point; Yang-I Lin, Nanuet; Thomas L. Fields, Pearl River; Paul F. Fabio, Pearl River, and Keith C. Murdock, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 705,312, Jul. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 606,805, Aug. 22, 1975, abandoned. This application Jul. 13, 1977, Ser. No. 815,400

Int. Cl.[2] A61K *31/155;* C07C *123/00*

U.S. Cl. 424—326 13 Claims

1. A compound of the formula:



wherein R_1 cycloalkyl having from 3–6 carbon atoms; wherein R_2 and R_3 are each individually selected from the group consisting of hydrogen and alkyl having from 1–4 carbon atoms; and pharmaceutically acceptable salts thereof.

4,141,993

COMPOUNDS OF DIPHENYLCYCLOPENTYLAMINE TYPE AND METHODS FOR THEIR PREPARATION

Bernt S. E. Carnmalm; Ulf H. A. Lindberg, both of Södertalje; Tomas De Paulis, Gnesta; Svante B. Ross, Södertalje; Nils-Erik Stjernstrom, Södertalje; Carl B. J. Ulff, Södertalje, and Sven-Ove Ogren, Södertalje, all of Sweden, assignors to Astra Läkemedel Aktiebolaget, Södertalje, Sweden

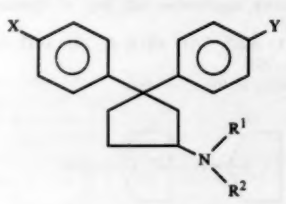
Division of Ser. No. 579,049, May 20, 1975, Pat. No. 4,053,637, which is a continuation of Ser. No. 257,707, May 30, 1973, abandoned. This application May 19, 1977, Ser. No. 798,446

Claims priority, application Sweden, Jun. 11, 1971, 717632

Int. Cl.[2] **A01N** *9/20, 9/24*

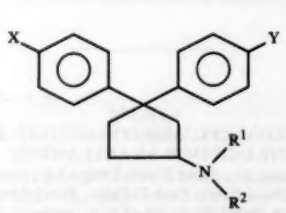
U.S. Cl. 424—330 **40 Claims**

1. A compound of the formula



wherein X and Y are the same or different and each represents a member selected from the group consisting of a hydrogen atom, a chloro group and a methoxy group and R^1 and R^2 are the same or different and each represents a member selected from the group consisting of a hydrogen atom or a methyl group, and pharmaceutically acceptable acid addition salts thereof.

31. A method for the treatment of depression which comprises administering to a host a pharmaceutically effective amount for the treatment of depression of a compound of the formula



wherein X and Y are the same or different and represent a member selected from the group consisting of a hydrogen atom, a chloro group and a methoxy group and R^1 and R^2 are the same or different and are selected from the group consisting of a hydrogen atom and a methyl group, and pharmaceutically acceptble acid addition salts thereof, together with a pharmaceutically acceptable carrier.

4,141,994

METHOD FOR PIGMENTING FISH FLESH

Rajindra Aneja, St. Albans; Alan P. Davies, Hitchen, both of England, and Maxwell C. Keith, Aberdeen, Scotland, assignors to Internationale Octooimaatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Mar. 21, 1977, Ser. No. 779,785

Claims priority, application United Kingdom, Mar. 22, 1976, 11478/76

Int. Cl.[2] **A61K** *31/12*

U.S. Cl. 424—331 **5 Claims**

1. A process of rearing anadromous fish, wherein said fish are reared in captivity on a diet containing a food additive comprising:

(a) An acyl lactylate consisting essentially of compounds having the formula:

$$RCO.O.CH(CH_3)CO.O.CH(CH_3)COOX$$

wherein RCO is an acyl group containing 12 to 20 carbon atoms and X is H or a metal atom, and

(b) a carotenoid pigment selected from the group consisting of canthaxanthin, astaxanthin and mixtures thereof, said acyl lactylate and said carotenoid pigment being present in a weight ratio of from 10:1 to 1:5, to impart pigmentation to the flesh of said fish.

4,141,995

KETONE DERIVATIVES

John C. Saunders, Maidenhead, and William R. N. Williamson, Slough, both of England, assignors to Lilly Industries Limited, London, England

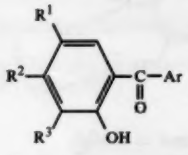
Continuation of Ser. No. 676,823, Apr. 14, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,259

Claims priority, application United Kingdom, Apr. 17, 1975, 15805/75

Int. Cl.[2] **C07C** *49/82;* **A01N** *9/24*

U.S. Cl. 424—331 **3 Claims**

1. A method of preventing asthmatic attacks in a mammal suffering from asthma comprising administering to said mammal a therapeutically effective dose of a compound sufficient to relieve the asthma of the formula:



wherein R^2 is hydrogen or ethyl, R^1 and R^3 are hydrogen, methyl, or ethyl, at least one of R^1, R^2 and R^3 being other than hydrogen and Ar is a phenyl group optionally substituted by from one to three groups selected from chlorine, fluorine, methyl or trifluoromethyl.

4,141,996

PROCESS FOR PRODUCING LIQUID MODIFIED PROTEIN

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 13, 1976, Ser. No. 685,733

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.[2] **A23J** *3/00*

U.S. Cl. 426—44 **14 Claims**

1. A process for producing a liquid plant protein product having improved odor, color and flavor properties, said process comprising:

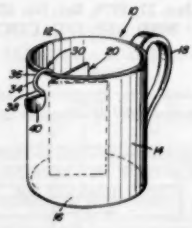
(a) making an aqueous slurry of a carbohydrate containing plant protein material containing at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 20 percent by weight;
(b) fermenting the slurry with about 0.1 to 5.0 percent by weight of yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33° F. to 90° F. for from four hours to ninety-six hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*
(c) adding an alkali metal hydroxide or ammonium hydroxide to the slurry in amount sufficient to form a carbonate and to make a first pH adjustment of the carbonate containing slurry to a pH within the range of from about 7.0 to about 10.5;
(d) heating the aqueous slurry to react the carbonate with the protein;
(e) making a second pH adjustment to the slurry to produce a pH in the range of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;
(f) admixing the slurry with from about 0.3 percent to about 2.0 percent by weight peroxide per pound of protein in the slurry; and
(g) heating the slurry under a vacuum of from 15 inches to 30 inches at a temperature sufficient to accomplish boiling, to remove steam volatile flavor substances.

4,141,997

MULTI-COMPARTMENT COFFEE STEEPING BAG AND SUPPORT CLIP THEREFOR

Edward C. Syroka, and Bernice A. Syroka, both of 123 A Lincoln Ave., Saugus, Mass. 01906

Filed Sep. 27, 1976, Ser. No. 726,759
Int. Cl.[2] B65B *29/02;* A47G *19/16*
U.S. Cl. 426—79 **4 Claims**



1. A beverage infusion package comprising a bag of flexible porous material and consisting of a pair of registered opposite side panels including corresponding first and second pairs of opposite side marginal edges, said panels being secured together along said first and second pairs of opposite side marginal edges, and registered straight median portions of said panels extending between the first pairs of opposite side marginal edges of said panels being secured dividing the interior of said bag into two separate compartments, said straight median portions of said panels defining fold zones thereof along which said bag may be folded, each of said compartments having a quantity of beverage infusion commodity therein, said bag being free of attachments directly connected thereto, a reuseable spring support clip including side-by-side long and short legs connected together at one pair of corresponding ends thereof by connecting structure extending therebetween, said long leg being removably engaged over and extending along the side of said median portions defining the included angle formed by said bag when folded along said median portions and said short leg being adapted to extend downwardly along the outer side of a beverage container side wall against whose inner surface said median portions of said panels are clamped by said long legs, said connecting structure comprising a curved bight portion formed integrally with said one pair of ends of said legs, said curved bight portion defining a single smoothly curved arcuate section of substantially 180° extent and whose ends merge smoothly into said one pair of ends of said legs, said short leg including base and free end portions adjacent and remote from the corresponding end of said arcuate section and a reversely curving portion intermediate and integral with said base and free end portions offsetting said free end portion relative to said base end portion into close juxtaposition relative to the adjacent side of said long leg.

4,141,998

BAKING INGREDIENT FOR SOURDOUGH COMPOSITIONS

William H. Ziemke, 1479 Glenpine Dr., San Jose, Calif. 95125, and Elmer F. Glabe, Northbrook, Ill., assignors to William H. Ziemke

Continuation-in-part of Ser. No. 645,537, Dec. 31, 1975, Pat. No. 4,034,125. This application May 12, 1977, Ser. No. 796,146
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.[2] A21D *2/08*
U.S. Cl. 426—99 **12 Claims**

1. A baking ingredient for use in making sourdough bakery products, said baking ingredient being in the form of a flowable powder for the introduction of acetic acid with or without fumaric, tartaric acids and/or citric acid into bread doughs and other bakery products comprising minor quantities of acetic acid without lactic acid and with or without fumaric, tartaric acids and/or citric acid absorbed on a major quantity of a finely divided solid edible absorbent which is a starchy polysaccharide or an edible cellulosic material, said baking ingredient being stabilized against premature loss of acetic acid and said other acids, if present, by intimate dispersion with a minor quantity of a normally solid edible fatty glyceride material sufficient to hold said acid or acids in the absorbent and reduce evaporation of said acid or acids during oven baking of said sourdough bakery products, the quantity of acetic acid being within the range of 2% to 15% by weight and the quantity of said other acids, if any, being within the range of 1% to 8% by weight.

4,141,999

BACON-LIKE MEAT ANALOG

George M. Lolas, Hoffman Estates, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 7, 1977, Ser. No. 840,123
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—104 **6 Claims**

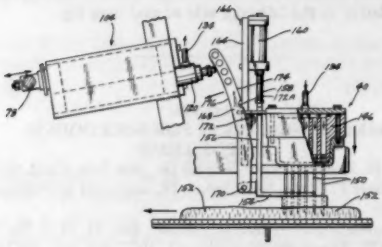
1. In a bacon-like meat analog having alternative expanded layers simulating the lean and fat portions of bacon, wherein the expanded layers simulating the lean portions are produced by cooking a composition mixture containing 10 to 40 percent vegetable protein fiber, 5 to 20 percent albumen, 5 to 20 percent starch, 30 to 60 percent water, 3 to 40 percent vegetable oil, 0.1 to 1.5 percent vegetable gum, 2 to 20 percent vegetable protein isolate, 0.05 to 0.50 percent dextrose, 0.005 to 0.05 percent food grade coloring and 5 to 20 percent flavors and seasonings and also containing a gas dispersed therein, the improvement which comprises expanded layers simulating the fat portions produced by cooking a composition mixture consisting essentially of 3 to 7 percent albumen, 25 to 40 percent water, 0 to 6 percent vegetable protein, 52 to 65 percent vegetable oil, 0.05 to 0.60 percent vegetable gums and 4 to 10 percent flavors and seasonings, said composition mixture also containing a gas dispersed therein, said percents being weight percent based on the total weight of the layer composition.

4,142,000

METHOD AND MEANS FOR INJECTING FLUIDS INTO MEAT PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Apr. 20, 1977, Ser. No. 789,017
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—281 18 Claims



1. The method of injecting fluid into a meat product or the like, by means of a fluid pump fluidly connected to a fluid manifold which is fluidly connected to a plurality of needles adapted to be intermittently inserted into and withdrawn from said meat product, comprising,

inserting said needles into said meat product and withdrawing said needles from said meat product in penetration and retraction strokes, respectively,

varying the velocity of inserting and withdrawing of said needles with respect to said meat product during said penetration and retraction strokes,

and supplying fluid to said meat product from said fluid pump through said manifold and said needles substantially continuously while said needles are within said meat product at a rate proportional to the velocity of said needles with respect to said meat product, whereby the rate of flow of fluid into said meat product is greater at the higher velocities of the needles, and is less at the lower velocities of said needles.

4,142,001

PREPARATION OF FROZEN RAW BATTERED PRODUCTS

John S. Kilpatrick, Richmond, Canada, assignor to Rupert's Certi-Fresh Foods, Inc., Seattle, Wash.

Filed May 9, 1977, Ser. No. 795,118
Int. Cl.[2] A23L *3/36;* A21D *10/04*
U.S. Cl. 426—302 13 Claims

1. The method that comprises:

applying a coating of raw batter to the outside of a food product;

placing said food product coated with said batter on a layer of carbon dioxide snow while the batter remains uncooked; and

rapidly setting the coating of completely uncooked batter on the food product to an essentially non-flowing condition by reduction in temperature of the batter coating while contacted by said layer of carbon dioxide snow.

4,142,002

METHOD FOR PRODUCING A BREWABLE ROASTED COFFEE AND WHEAT PRODUCT

Clifford H. Spotholz, Montvale, N.J.; Edward L. Scarsella, Bedford Hills, N.Y., and Slawko Yadlowsky, Manville, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 17, 1978, Ser. No. 906,493
Int. Cl.[2] A23F *1/02, 1/16*
U.S. Cl. 426—595 8 Claims

1. In a method for producing a roasted and comminuted coffee-wheat product containing at least 35% by weight coffee and 35% by weight wheat, the improvement comprising roasting raw wheat to an end temperature of between 450° and 460° F. over a period of from 40 to 90 minutes.

4,142,003

NON-AEROSOL VEGETABLE OIL COMPOSITIONS CONTAINING LECITHIN AND PURE ETHYL ALCOHOL

Vasant D. Sejpal, Jersey City, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,481
Int. Cl.[2] A23D *5/00;* A23J *7/02*
U.S. Cl. 426—601 9 Claims

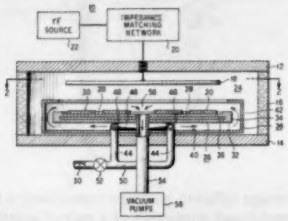
1. An edible composition comprising 3 to 12 percent by weight lecithin and 1 to 15 percent by weight of 190° to 200° proof ethyl alcohol, the remainder being substantially all liquid vegetable oil provided that when 190° proof ethyl alcohol is used the alcohol concentration is 1 to 8 percent in compositions containing the maximum of 12 percent lecithin and 1 to 5 percent in compositions containing the minimum of 3 percent lecithin.

4,142,004

METHOD OF COATING SEMICONDUCTOR SUBSTRATES

Victor E. Hauser, Jr., Palmerton, Pa., and Ashok K. Sinha, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 22, 1976, Ser. No. 651,556
Int. Cl.[2] B05D *1/08, 5/12;* C23C *11/08*
U.S. Cl. 427—39 1 Claim



1. A method for providing a silicon-nitrogen coating resistant to cracking on a silicon substrate comprising the steps of

placing the substrate in a nonsputtering type of radial flow reactor,

evacuating the reactor to a high vacuum,

heating the substrate to a temperature of about 300° C.

introducing into the reactor a flow of gas comprising a mixture of argon, silane and ammonia and substantially free of oxygen and nitrogen, the ratio of silane to ammonia by volume being between 0.5 and 1.0, the rate of flow being at least 1500 SCCM, the dynamic pressure within the reactor being about 1000 microns, and the mixture being at least 95 percent argon, and

applying radio frequency energy to the reactor of sufficient amount based on the size and spacing of the electrodes in said reactor to establish a plasma glow discharge in the region of the substrate for depositing a silicon-nitrogen film on the substrate having either a low tensile or a compressive stress and relatively high resistivity.

4,142,005

PROCESS FOR PREPARING AN ELECTRODE FOR ELECTROLYTIC CELL HAVING A COATING OF A SINGLE METAL SPINEL, Co_3O_4

Donald L. Caldwell, and Mark J. Hazelrigg, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company

Filed Feb. 27, 1976, Ser. No. 661,879
Int. Cl.[2] C25D 17/10; C25B 11/04, 11/10
U.S. Cl. 427—126 16 Claims

1. A process for preparing improved electrolytic cell anodes comprising an electrically-conductive substrate having a coating consisting essentially of a single-metal spinel, Co_3O_4, the said process comprising

(a) providing an electrically-conductive substrate substantially free of foreign matter or oxide film,

(b) applying to the substrate a thin coating of a thermally decomposable inorganic cobalt compound which, when thermally decomposed in the presence of oxygen gives Co_3O_4,

(c) heating the so-coated substrate at a temperature in the range of about 200° C. to about 600° C. in an oxidizing atmosphere for a time sufficient to oxidize the inorganic cobalt compound to Co_3O_4, then cooling it, and

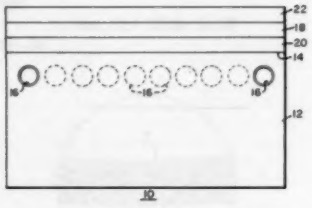
(d) repeating the above coating step (b) and heating step (c) until the layer of Co_3O_4 on the substrate has a thickness in the range of about 0.01 mm to about 0.08 mm.

4,142,006

METHOD OF MAKING A HIGH POWER LASER MIRROR

Wolfgang J. Choyke, Pittsburgh, and Richard A. Hoffman, Export, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 481,268, Jun. 20, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 661,921
Int. Cl.[2] G02B 5/08
U.S. Cl. 427—162 11 Claims



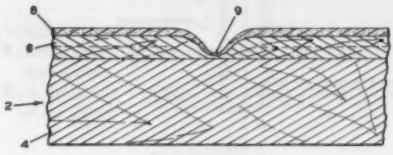
1. The method for producing a high power laser mirror, the steps comprising forming a substrate of a refractory composition having a thermal conductivity of at least 2 watts/cm° K., a thermal expansion coefficient of less than 5×10^{-6}/° C., a hardness of at least 9 MOH and a density of less than 4 gm/cm^3, said material having a density in excess of about 99% of theoretical density, polishing an optical surface on at least one surface of the substrate, depositing a film of a high reflectivity metal on the optical surface, said film having a thickness not in excess of 8,000 angstroms, and depositing a transparent dielectric film of less than 2,000 angstroms in thickness over the metal of high reflectivity.

4,142,007

EMBOSSED LAMINATED BOARD

John G. Lampe, High Point, and Paul W. Whitley, Lexington, both of N.C., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 741,779, Nov. 15, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,796
Int. Cl.[2] B32B 3/30, 31/20
U.S. Cl. 428—165 7 Claims



1. An improved laminated board structure which comprises:

(a) a bonded particle core stock having a ball hardness of 800 or more,

(b) a natural wood veneer covering over the core stock, said veneer covering having a ball hardness less than the core stock and being several hundred units less than the ball hardness of the core stock,

(c) a bonded wood fiber surface sheet covering said wood veneer, and

(d) said laminated structure having surface embossing which is over twice the thickness of said wood fiber surface sheet.

4. The method of manufacturing an improved embossed board, which method comrprises:

(a) covering a bonded particle core stock having a ball hardness of 800 or more with a natural wood veneer having a ball hardness of several hundred units less than the hardness of the core stock,

(b) covering said veneer with a bonded wood fiber sheet,

(c) laminating said core stock, veneer, and wood fiber sheet together, and

(d) embossing with heat and pressure said above laminated three-layer structure to deeply emboss said structure over twice the thickness of said wood fiber sheet.

4,142,008

CARBON FILAMENT COATED WITH BORON AND METHOD OF MAKING SAME

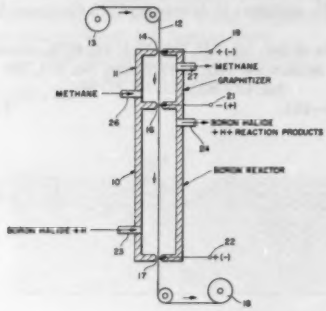
Harold E. DeBolt, Andover, Mass., assignor to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 230,867, Mar. 1, 1972, abandoned. This application Jun. 27, 1977, Ser. No. 810,240
Int. Cl.[2] B32B 9/00; C23C 11/00
U.S. Cl. 427—249 6 Claims

1. A method of forming high strength-high modulus boron filaments on a carbon substrate comprising:

heating the carbon filament at a temperature in excess of

about 2300° C. and depositing a layer of pyrolytic graphite on the substrate surface; and



depositing a boron coating on said pyrolytic graphite coating.

4,142,009

METHOD OF TREATING TIMBER WITH COMPOSITION HAVING A COLLOIDAL PIGMENT

Colin T. Kyte, Marlow; Geoffrey J. Lewis, Hazelmere; Edgar Pearce, High Wymcombe, and Keith Hume, Camberley, all of England, assignors to Fosroc International Limited, England

Continuation of Ser. No. 497,161, Aug. 13, 1974, Pat. No. 4,062,991. This application May 24, 1977, Ser. No. 800,152

The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

Int. Cl.[2] B05D *3/00*

U.S. Cl. 427—297 **4 Claims**

1. A method of treating timber comprising subjecting the timber to a first vacuum, applying a liquid organic preservative composition to the timber, optionally applying a positive pressure to the liquid composition, said vacuum and said pressure being applied in a sufficient amount and for a sufficient time to permit the liquid composition ot penetrate the timber on all surfaces thereof, said liquid composition comprising a preservative composition in an organic solvent and a colloidal pigment being present in the preservative composition in an amount from about 3% to about 25% by weight, said colloidal pigment having a mean particle diameter size in the range of about 0.02 micron to about 1 micron, said colloidal pigment being present in an amount sufficient to enhance the grain pattern of the timber, removing the liquid composition, applying a second vacuum to the timber to remove excess liquid composition and releasing the second vacuum.

4,142,010

METHOD FOR APPLYING A VISCOUS FLUID TO A SUBSTRATE

David J. Pipkin, Longmont, and Donald W. Schaefer, Lakewood, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,972

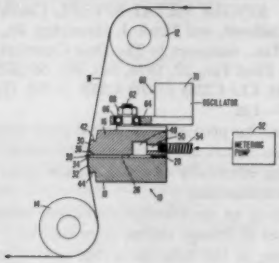
Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—355 **3 Claims**

1. A method of extruding a viscous liquid onto a substrate which is moving relative thereto, comprising the steps of,

providing an extrusion die having a fluid conducting passage formed therein, providing slanting V shaped fluid reservoir terminating at a discharge opening, and communicating with said fluid conducting passage, the discharge opening of the fluid reservoir being at least twice, but no more than ten times, the width of the fluid conducting passage and extending at least partially on the upstream side thereof, providing a smooth surface on said assembly bounding said discharge opening,

providing both a downstream edge and an extreme upstream edge of said die assembly in an acute angle configuration with the smooth surface,



supplying fluid to the passage in metered amounts, spreading the coating on the substrate from said reservoir through the discharge opening by moving the substrate relative to the assembly in contact with the smooth surfaces.

4,142,011

METHOD OF PRODUCING COATINGS OF COPPER ALLOY ON FERROUS ALLOYS

Adam Gierek; Lech Bajka, and Malgorzata Machnicka, all of Katowice, Poland, assignors to Politechnika Slaska im. Wincentego Pstrowskiego, Gliwice, Poland

Filed Aug. 11, 1976, Ser. No. 713,604

Claims priority, application Poland, Aug. 19, 1975, 182831

Int. Cl.[2] C23C *1/10, 1/04*

U.S. Cl. 427—431 **8 Claims**

1. A method of producing a coating of a copper alloy on a workpiece made of ferrous alloy, said method comprising dipping the ferrous alloy workpiece to be coated into a molted bath of 75–84% copper with the balance being Si or Sn at a temperature of about 850° C., holding said workpiece in said bath for 15 seconds to 60 minutes to form the copper alloy coating thereon and then removing the workpiece from the bath.

4,142,012

TREE SIMULATIVE DISPLAY

Herbert M. Clamage, 9627 Kildare, Skokie, Ill. 60076

Filed May 22, 1978, Ser. No. 908,067

Int. Cl.[2] A47G *33/06*

U.S. Cl. 428—8 **15 Claims**

1. A flora simulative display comprising a standard, at least one tier of conical holders secured permanently along the length of said standard, a base having means for receiving said standard with the standard arranged vertically and the holders distributed about the circumference of said standard, each of said tiers including a ring and plural holders permanently secured thereto about the circumference thereof and a crossbar

also secured to said ring, the standard passing through said ring and being permanently secured to said crossbar thereof, and

plural branch members each having one end seated securely within a holder.

4,142,013

SHAPED ARTICLE OF CELLULOSE HYDRATE WITH A COATING OF PLASTIC MATERIAL OF CHEMICALLY MODIFIED PROTEIN AND PROCESS FOR THE PRODUCTION THEREOF

Klaus-Dieter Hammer, Mainz; Wolfgang Klendauer, and Martin Schröder, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

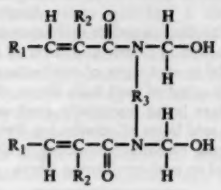
Division of Ser. No. 619,225, Oct. 3, 1975, Pat. No. 4,097,623. This application Jan. 13, 1978, Ser. No. 869,356

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1974, 2447757

Int. Cl.[2] B32B *23/08*

U.S. Cl. 428—36 **7 Claims**

1. A shaped article based on cellulose hydrate and having on its surface a coating of protein, said coating being directly on the surface of the shaped article, firmly connected therewith, and composed of chemically modified protein obtained by mixing an aqueous alkaline protein solution with an aqueous solution of N-methylol-acrylamide or N-methylol-methacrylamide or of organic tetrafunctional, doubly unsaturated compounds of the general formula



in which

R_1 and R_2 are hydrogen or an alkyl group with 1 to 6 carbon atoms, and

R_3 is the group $-(CH_2)_n-$, n being an integer from 1 to 8, or the group

in which R_4 is an alkyl group with 1 to 18 carbon atoms, said liquid mixture being subjected to a dwell time.

4,142,014

LAMINATE CARRYING A DISCRETE LAYER OF METAL SALTS OF LONG CHAIN ALKYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMERS

Thomas S. Mestetsky, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 190,388, Oct. 18, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,709

Int. Cl.[2] E04F *13/20, 15/16;* C09J *7/02, 7/04*

U.S. Cl. 428—40 **2 Claims**

1. A laminated product comprising a non-absorptive substrate, at least one surface of which carries a discrete, continuous layer deposited from a surface release composition comprising an organic solvent solution containing a metal salt of a hydrolyzed alky vinyl ether-maleic anhydride copolymer wherein alkyl contains 8–22 carbon atoms and the metal salt contains from 5 mole % to 350 mole % of the metal based on the copolymer; said layer being in contact with a second substantially non-absorptive surface from which it is readily releasable.

4,142,015

THERMAL CAMOUFLAGE

Earl F. Bienz, Locust Grove, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1977, Ser. No. 793,690

Int. Cl.[2] F41H *3/00;* B32B *3/00*

U.S. Cl. 428—159 **8 Claims**

1. Camouflage means to disguise the infrared signature of a target device having a recognizeable pattern of relatively hot portions on the surface thereof compared to the temperature of its natural background comprising:

a surface layer of foamed plastic substantially covering said device, said surface layer varying in heat insulating effect as a random function of position on said surface.

4,142,016

LAYERED FABRICS AND PROCESSES FOR PRODUCING SAME

Glen D. Perry, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 555,006, Mar. 3, 1975. This application Mar. 15, 1976, Ser. No. 667,002

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—284 **29 Claims**

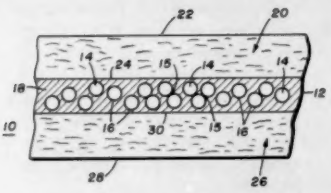
1. Fabric comprising a layer of bulk fibers predominantly composed of short fibers having essentially no fiber lengths

exceeding 10 mm, a layer of reinforcing fibers comprising textile fibers and a bonding agent distributed essentially throughout and binding together said layer of bulk fibers and said layer of reinforcing fibers, said layer of bulk fibers being essentially parallel to said layer of reinforcing fibers and comprising at least 8 g/m^2 of said bulk fibers, the fibers, in said layer of bulk fibers being essentially randomly oriented in a plane parallel to said layer of reinforcing fibers and said layer of bulk fibers being essentially uniform in fiber density in all directions parallel to said reinforcing fibers.

4,142,017
FLEXIBLE LAMINATES AND PROCESSES FOR PRODUCING SAME

William A. Blackburn, Chapel Hill, and Roy D. Goodwin, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,423
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—284 **36 Claims**



1. A flexible laminate, comprising: a reinforcing web said web having upper and lower surfaces and comprising essentially all lightly bonded fibers said fibers being coated with a finish; an adhesive distributed essentially throughout said web and surrounding the fibers comprising said web, said adhesive being prevented from contacting said fibers by said finish; and, at least one outer layer of fibers adhesively bonded to at least one surface of said web.

4,142,018
PROCESS FOR FORMING METALLIC FINISH COATINGS

Hiroshi Ozawa; Yoshinori Torii; Nobuki Kobayashi, and Koji Ishikawa, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Jan. 24, 1977, Ser. No. 762,182
Claims priority, application Japan, Jan. 30, 1976, 51-8334
Int. Cl.[2] B32B *7/08;* B05D *3/02*
U.S. Cl. 428—323 **10 Claims**

1. A process for forming a coating with a metallic finish, which comprises:

(1) a first step of coating an article with [A] a water-thinnable paint consisting essentially of (a) a cross-linkable resin which is a (meth)acrylate ester copolymer or a mixture of (meth)acrylate ester copolymers containing (i) at least 0.1 equivalent, per 1,000 g of resin solids, of a carboxyl or carboxyl ion group and (ii) a group capable of undergoing a ring-opening reaction with the carboxyl or carboxyl ion group upon heating, which group is glycidyl, β-methylglycidyl or oxazolinyl, both of groups (i) and (ii) being contained in the same or different copolymers, and said copolymer or copolymers having a number average molecular weight of at least 3,000, said water-thinnable paint being in the form of either an aqueous solution of salt of the resin in water, an emulsion of fine particles of the resin solids dispersed in water, or a system in which the aqueous solution and the emulsion exist together and (b) metallic scales, and baking the coated paint to form a coating containing the metallic scales, and then

(2) a second step of coating [B] a powder paint comprising a (meth)acrylate ester copolymer having a glycidyl or β-methylglycidyl group and a polycarboxylic acid on the scale-containing coating obtained in the first step, and baking the coated paint to form a protective coating for the scale-containing coating.

4,142,019
POLYMER COATED HEAT INSULATED ELECTRICAL CONDUCTOR COMPRISING A LAYER OF ELECTRICALLY INSULATING, HEAT RESISTANT FIBROUS MATERIAL

John A. Jukes, Dollard-des-Armeaux, and Philip A. McGettigan, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 574,608, May 5, 1975. This application Jun. 21, 1978, Ser. No. 917,526
Int. Cl.[2] H01B *3/30, 3/48, 3/52*
U.S. Cl. 428—380 **5 Claims**

1. An insulated electrical conductor comprising:

a core;

an inner coating of electrically insulating heat resistant fibrous material on the core; and a uniform outer coating of fused polymeric material formed from polymeric particles fused one with another to provide a smooth pin-hole free surface.

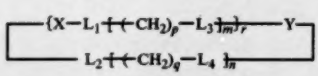
4. A conductor as claimed in claim 1 including an intermediate coating of a fused mixture of a flame retardant material and a polymeric material.

4,142,020
HETERO-MACROCYCLIC COMPOUND COATED ON THE SURFACE OF SOLID

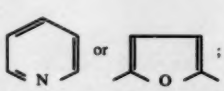
Hiromichi Okamura; Iwao Kato, both of Ichihara; Michio Hiraoka, Tokyo, and Kinuko Torium, Ichihara, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,446
Claims priority, application Japan, Jul. 8, 1976, 51-80332
Int. Cl.[2] B32B *33/00*
U.S. Cl. 428—403 **2 Claims**

1. A hetero-macrocyclic compound coated on the surface of a solid useful for the selective capture of a cation, comprising a reaction mixture of: (a) a hetero-macrocyclic compound having at least one amino group in the molecule having the following structural formula:



wherein X is an amino- or alkylamino-substituted divalent aromatic or alicyclic hydrocarbon radical, or hetero-cyclic radical or —NH—; Y is an amino- or alkylamino-substituted aromatic or alicyclic hydrocarbon radical or heterocyclic radical, $—CH_2—CH_2—$,



;

L_1, L_2, L_3 and L_4 are independently —O—, —S—, or

(and R is a hydrocarbon radical having 1 to 10 carbon atoms); p and q are independently 2 or 3; r is 1, 2 or 3; and m and n are independently from 1 to 7; and, (b) a compound selected from the group consisting of an epoxy compound and an isocyanate compound.

2. A hetero macrocyclic compound coated on the surface of

the solid of claim 1, wherein the solid is selected from the group consisting of metal, glass, ceramic, alumina, silica, diatomaceous earth, carbon, sand, clay, cellulose, polyamide, polystyrene, polyester and polyacrylonitrile.

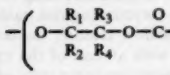
4,142,021

OXYGEN BARRIER LAMINATE FILMS INCLUDING A POLYALKYLENE CARBONATE ADHESIVE

Dale D. Dixon, Kutztown, and Michael E. Ford, Trexlertown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 1, 1977, Ser. No. 802,393
Int. Cl.² B32B *27/36*
U.S. Cl. 428—412 **12 Claims**

1. In a laminate structure comprising a base layer and a polycarbonate layer bonded to the base layer, the improvement wherein the polycarbonate layer is an adhesive barrier layer and the polyalkylene carbonate is represented by the formula:



R_1 is hydrogen, a halomethyl group or hydrocarbyl group having from 1 to 6 carbon atoms;
R_3 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;
R_2 and R_4 are hydrogen, or hydrocarbyl groups having from 1 to 6 carbon atoms; or
R_1, R_2, R_3 and R_4 are combined together constituting a carbocyclic ring having from 4 to 7 carbon atoms; and
n is a number from about 250 to about 6,500.

4,142,022

CERAMIC-METAL LAMINATE

Arnold R. Erickson, Orange; Carlino Panzera, Cromwell, and Robert P. Tolokan, Hamden, all of Conn., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 5, 1976, Ser. No. 674,047
Int. Cl.² B32B *5/02, 5/06*
U.S. Cl. 428—432 **1 Claim**

1. A composite structure comprising:
(a) fired high temperature ceramic member having 2 opposing exterior surfaces; and
(b) a plurality of bifurcated metal staples, the bifurcated portions of the staples being embedded in the ceramic member, the cross-piece connecting the biforcated portions of the staples being exterior one of the opposing exterior surfaces of the member, the distal ends of the staple projecting completely through the member and being on the outside of the other opposing exterior surface in a position approximately perpendicular to the bifurcated portions of the staple, the cross member and ends of the staple being arranged in such a manner to form a geometric bond with the ceramic member, there being no chemical interface formed between the staple and member.

4,142,023

METHOD FOR FORMING A SINGLE-PHASE NICKEL ALUMINIDE COATING ON A NICKEL-BASE SUPERALLOY SUBSTRATE

Norman S. Bornstein, West Hartford, and Michael A. DeCrescente, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 641,206, Dec. 16, 1975, abandoned. This application Aug. 24, 1977, Ser. No. 827,420
Int. Cl.² C23C *13/02*
U.S. Cl. 428—680 **9 Claims**

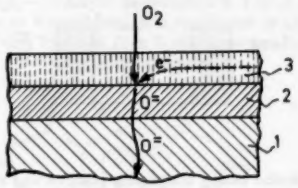
1. A process for forming on a nickel-base superalloy substrate, a single-phase nickel aluminide coating containing chromium which comprises:
(a) enriching the surface of said nickel-base superalloy substrate with a face centered cubic solution of chromium in nickel, said substrate remaining substantially free from a body-centered cubic coating of chromium or a chromium-base alloy; by diffusing chromium into said substrate from a source of chromium comprising a mixture of nickel and chromium in which the amount of chromium does not exceed the amount of chromium which would be soluble in the nickel; and
(b) forming a nickel-aluminide coating on the chromium enriched substrate by causing nickel to diffuse outwardly from said substrate into an aluminum-containing pack in which the source of aluminum is a material selected from the group consisting of the intermetallic compound NiAl and a metal powder pack having the overall activity of aluminum associated with NiAl.

4,142,024

ELECTROLYTE-CATHODE ASSEMBLY FOR A FUEL CELL

Paul Van den Berghe, 43 Cours Sablon, 63000 Clermont-Ferrand, France, and Helmut Tannenberger, La Villette 218, 1451 Le Chateau de Ste Croix, Switzerland

Filed May 27, 1977, Ser. No. 801,391
Claims priority, application Switzerland, May 28, 1976, 6738/76
Int. Cl.² H01M *8/12*
U.S. Cl. 429—41 **4 Claims**



1. An electrolyte-cathode assembly for a solid electrolyte fuel cell intended for operation at high temperature, which assembly comprises a solid ceramic electrolyte gas-tight body which is capable of conducting oxygen ions, and at least one layer of electron-conducting material in contact with the electrolyte and deposited on the surface thereof, wherein the layer of electron-conducting material is a compact layer having a thickness of at least 1 micron and at most 50 microns and consisting of a mixture containing from 20 to 80% by volume of indium oxide In_2O_3 doped with tin oxide, the remainder being a ceramic material capable of conducting oxygen ions and electrons at the cell operating temperature and which is a mixed oxide solid solution crystallized in the cubic system, consisting essentially of (1) zirconium oxide ZrO_2, (2) at least one oxide stabilizing the cubic phase of zirconium oxide and (3) uranium oxide UO_2, the said layer being covered with a gas permeable surface layer having a thickness of at least 30 microns and at most 200 microns consisting essentially of indium oxide doped with tin oxide and having a dendritic structure.

4,142,025

SEALED NICKEL CADMIUM BATTERY CAPABLE OF WITHSTANDING HIGH RATE OVERDISCHARGE

Paul F. Ritterman, Granada Hills, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 17, 1976, Ser. No. 724,188
Int. Cl.² H01M *10/34*
U.S. Cl. 429—60 **4 Claims**

1. In a nickel cadmium battery cell having a sealed casing

containing positive and negative electrodes immersed in an electrolyte and characterized by high rate cell reversal capability due to enhanced hydrogen recombination at the negative electrodes, and wherein when the cell is in a state of positive limiting on discharge with all positive capacity exhausted, the total cell reaction occurs according to the equation

$$Cd + 2H_2O \rightarrow Cd(OH)_2 + H_2$$

the improvements wherein each negative electrode comprises:

a support;

a sintered catalyst layer covering said support;

cadmium material on said support providing an exposed active electrode surface contacting said electrolyte;

said cadmium material saturating portions only of said catalyst layer in such a way as to provide cadmium-free regions of said catalyst layer having exposed catalyst surfaces of substantial area contacting said electrolyte; and

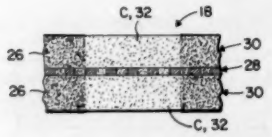
the catalyst of said catalyst layer being selected from the group consisting of nickel, silver, carbon, platinum, and lattice defect bronze and being exposed to said electrolyte, whereby hydrogen evolved in said cell state combines with the cadmium of the negative electrode according to the reaction

$$H_2 + (c) \rightarrow 2H(c)$$

$$2H(c) + Cd(OH)_2 \rightarrow Cd + 2H_2O$$

where (c) represents said catalyst.

3. A negative electrode for a nickel cadmium battery cell



having a sealed casing containing positive and negative electrodes immersed in an electrolyte and characterized by high rate cell reversal capability due to enhanced hydrogen recombination at the negative electrodes, and wherein when the cell is in a state of positive limiting on discharge with all positive capacity exhausted, the total cell reaction occurs according to the equation

$$Cd + 2H_2O \rightarrow Cd(OH)_2 + H_2$$

said negative electrode comprising:

a support;

a sintered catalyst layer covering said support;

cadmium material on said support providing an exposed active electrode surface for contacting said electrolyte;

said cadmium material saturating portions only of said catalyst layer in such a way as to provide cadmium-free regions of said catalyst layer having exposed catalyst surfaces of substantial area for contacting said electrolyte; and

the catalyst of said catalyst layer being selected from the group consisting of nickel, silver, carbon, platinum, and lattice defect bronze and exposed to said electrolyte, whereby hydrogen evolved in said cell state combines with the cadmium of the negative electrode according to the reaction

$$H_2 + (c) \rightarrow 2H(c)$$

$$2H(c) + Cd(OH)_2 \rightarrow Cd + 2H_2O$$

where (c) represents said catalyst.

4,142,026

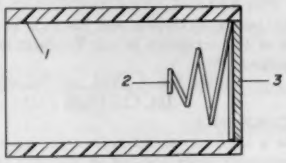
DRY CELL ADAPTER

Macario J. Zordan, 12/9th St., Waterford, N.Y. 12188

Filed Apr. 22, 1977, Ser. No. 789,778

Int. Cl.[2] H01M *2/10*

U.S. Cl. 429—100 2 Claims



1. A dry cell adapter comprising a non-conductive cylindrical tube open at one end and closed at the other end by a hollow interior metallic closure including two parts each part having a bottom and a surrounding rim, said rims being fitted together forming the hollow closure, the bottom of one part being externally flush with an end of the cylinder, said tube having external dimensions approximately equal to those of a size D cell with its inside diameter permitting snug insertion of a size C cell, the bottom of the other closure part having a protuberance in its center of sufficient area and height, interior of said tube, permitting reliable electrical connection of said closure to permit electrical continuity for a distance equal to the difference in length between that of a size D cell and that of a size C cell.

4,142,027

ALKALINE NICKEL-CADMIUM STORAGE BATTERY

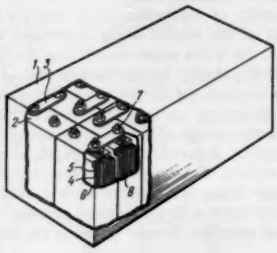
Mikhail S. Tsygankov, ulitsa Ordzhonikidze, 14, kv. 24; Valery N. Kosholkin, Novo-Astrakhanskoe shosse, 43, kv. 47; Nina A. Bitjutskaya, ulitsa Stepana Razine, 36, kv. 18, and Oleg G. Malandin, ulitsa Sovetskaya, 23, kv. 23, all of Saratov, U.S.S.R.

Continuation of Ser. No. 482,597, Jun. 24, 1974. This application Aug. 25, 1976, Ser. No. 717,479

Claims priority, application U.S.S.R., Jun. 22, 1973, 1933895

Int. Cl.[2] H01M *10/30*

U.S. Cl. 429—159 6 Claims



1. An alkaline nickel-cadmium storage battery suitable for usage in locations requiring reduced weight and increased activity per unit weight of the active surface areas particularly for use in transport facilities as a standby source of electrical energy, comprising:

a container;

cells located in said container, each said cell including:

a jar,

positive cerametallic plates,

pasted thin negative cadmium-oxide plates free of baked nickel sponge, said negative plates being less than 0.9 millimeters in thickness, the ratio of the thickness of said

negative plates to the thickness of said positive plates being in the range of 0.45 to 0.60,

separators between said positive and negative plates positioned in said jar,

terminal posts for said positive and said negative plates for assembling thereof into groups; and

intercell connectors coupled with said terminal posts connecting said cells in series.

4,142,028

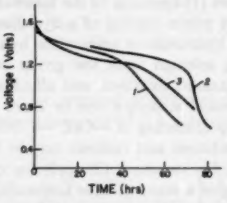
NONAQUEOUS CELLS UTILIZING ALUMINUM, MAGNESIUM, AND CALCIUM ANODES IN AMIDE-BASED ELECTROLYTES

Violeta Z. Leger, North Olmsted, and George E. Blomgren, Lakewood, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,901

Int. Cl.[2] H01M *6/14*

U.S. Cl. 429—194 **13 Claims**



1. A nonaqueous cell comprising an anode selected from the group consisting of aluminum, magnesium, calcium and their alloys, and wherein at least the surface of the anode is amalgamated; a solid cathode selected from the group consisting of MnO_2, CuF_2, NiF_2, V_2O_5, Ag_2O, HgO, Cu_2O, CuO, PbO_2, PbO, and Fe_2O_3; and an electrolyte solution comprising a salt dissolved in a nonaqueous solvent of an aprotic alkylated amide.

4,142,029

BIS-TETRAZOLES AS CHEMICAL BLOWING AGENTS FOR FOAMING THERMOPLASTIC RESINS

Hugo Illy, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

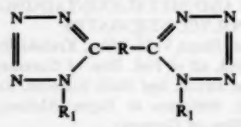
Filed Jul. 12, 1977, Ser. No. 814,827

Claims priority, application Switzerland, Jul. 16, 1976, 9138/76

Int. Cl.[2] C08J *9/10*

U.S. Cl. 521—95 **6 Claims**

1. Process for foaming a thermoplastic resin, which process comprises adding to the thermoplast 0.05 to 5% by weight of a bis-tetrazole of the formula I, II or III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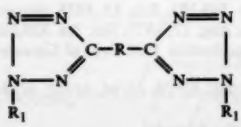
II

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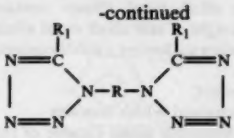
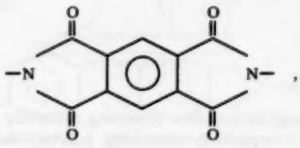

III

wherein R_1 represents hydrogen, C_1–C_4-alkyl, C_5–C_6-cycloalkyl, phenyl, naphthyl, or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, and R represents a direct bond, or a straight-chain or branched-chain alkylene group having 1–10 C atoms, which can be substituted by phenyl, benzyl, halogen, nitro, hydroxy, C_1–C_4-alkoxy, formyl, C_2–C_5-alkanoyl, benzoyl or cyclohexylcarbonyl, or R represents an alkylene group which has 2–8 C atoms and which is interrupted by —O—, —S—, —SO_2— or —NY—, wherein Y represents hydrogen, C_1–C_4-alkyl, phenyl, naphthyl, cyclohexyl, benzyl, or a group of the formula R_2CO— or R_2SO_2—, and R_2 represents C_1–C_4-alkyl, phenyl, or phenyl substituted by C_1–C_4-alkyl, halogen or C_1–C_4-alkoxy, or R represents an alkenylene or alkynylene group each having 2–8 C atoms, or a radical of the formula —Ar—$(CH_2)_m$—, —$(CH_2)_m$—Ar—$(CH_2)_m$—, —$(CH_2)_m$—O—Ar—O—$(CH_2)_m$—, —$(CH_2)_m$—NH—Ar—NH—$(CH_2)_m$—, —$(CH_2)_m$—Ar—X—Ar—$(CH_2)_m$—, —$(CH_2)_m$—O—Ar—X—Ar—O—$(CH_2)_m$— or —$(CH_2)_m$—NH—Ar—X—Ar—NH—$(CH_2)_m$—, wherein m represents 1 or 2, and Ar represents a phenylene or naphthylene group, which can be substituted by halogen, NO_2, alkyl or alkoxy each having 1–4 C atoms, and X represents a direct bond, —O—, —S—, —SO_2—, —CH_2—, —$C(CH_3)_2$ or —CO—, or R represents a bivalent heterocyclic radical of the formula —$(CH_2)_n$—Het—$(CH_2)_n$—, wherein n represents 0, 1 or 2, and Het represents a 5- or 6-membered, non-condensed or condensed hetero ring having 1 to 3 N, O or S atoms, or a radical of the formula



or R represents in the formula III a group of the formula —Ar— or —Ar—X—Ar— or, if R_1 is not hydrogen, represents also in the formula I or II a group of the formula —Ar— or —Ar—X—Ar—; and subsequently heating the mixture.

4,142,030

INORGANIC-ORGANIC PLASTIC

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany; Peter Markusch, New Martinsville, W. Va., and Helmut Reiff, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 527,386, Nov. 26, 1974, Pat. No. 4,042,536. This application May 11, 1977, Ser. No. 795,834

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1973, 2359606

Int. Cl.[2] C08G *18/38, 18/32*

U.S. Cl. 521—100 **11 Claims**

1. A process for producing an inorganic-organic plastic with high strength, elasticity, dimensional stability under heat, and flame resistance, which is a composite material of a polymer/-polysilicic acid gel, said composite being in the form of a solid/solid xerosol, said process comprising mixing and reacting:

(A) an organic polyisocyanate which is the phosgenation product of an aniline formaldehyde condensation,

(B) a silica composition selected from the group consisting of:

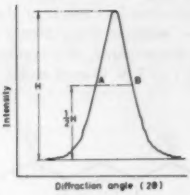
(i) an aqueous alkali metal silicate containing about 20–70% by weight of said alkali metal silicate,
(ii) an aqueous silica sol having a solids content from 20 to 50%, and
(iii) mixtures thereof,
(C) an organic compound which contains
(i) at least two hydrogen atoms capable of reacting with an isocyanate group, and
(ii) at least one non-ionic hydrophilic group, said non-ionic hydrophilic group being a polyether group which contains at least 10% by weight ethylene oxide groups, said mixing being carried out in such a way that either components (B) and (C) are mixed prior to mixing with (A), or components (A), (B) and (C) are mixed simultaneously, the mixing ratio of organic content to silicate content being between 70:30 to 20:80.

4,142,031

POLYCAPROLACTAM COMPOSITION HAVING IMPROVED MELT SPINNABILITY AND METHOD FOR IMPROVING MELT SPINNABILITY OF POLYCAPROLACTAM

Tetsuya Kato, Nagoya; Akira Ishitani, and Kiyotomi Kobori, both of Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 845,956
Int. Cl.[2] C08G *85/00*
U.S. Cl. 526—4 **11 Claims**



1. A polycaprolactam fiber consisting essentially of a polycaprolactam composition comprising polycaprolactam and, incorporated therein, 0.05 to 2.0% by weight of magnesium oxide in which the half-width of the X-ray diffraction profile at (200) as determined according to the method described in the text of the specification is at least 0.3.

4,142,032

PROCESS FOR IMPROVING BARRIER PROPERTIES OF POLYMERS

Paul F. D'Angelo, Monroe, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,601
Int. Cl.[2] C08F *8/20, 8/22*
U.S. Cl. 526—43 **11 Claims**

1. A process for improving the barrier properties of at least one olefinic or styrene-containing polymer which comprises contacting said polymer with fluorine and a bromine source wherein:
(a) the ratio in volume percent of fluorine to said bromine source is from about 0.1 to 1, to about 100 to 1,
(b) the pressure does not substantially exceed about one atmosphere,
(c) the temperature is from about 0° C. up to about the melting point of said polymer article, and
(d) the treatment time is from about 1 minute or less to about 30 minutes, and thereafter recovering said article having improved barrier properties.

4,142,033

INVERSION POLYMERIZATION PROCESS FOR PRODUCING VINYL RESINS

Donald E. Witenhafer, North Olmsted, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 15, 1978, Ser. No. 905,692
Int. Cl.[2] C08F *14/06*
U.S. Cl. 526—62 **15 Claims**

1. In a process of inversion polymerizing substantially water-insoluble polymerizable ethylenically unsaturated monomer(s) in a reaction vessel by first forming a continuous monomer(s) phase in the presence of a monomer-soluble surface active agent and a monomer-soluble catalyst, polymerizing said monomer phase at a temperature in the range of about 30° C. to about 80° C. with agitation until a conversion to polymer less than about 20% occurs, adding sufficient water to the monomer-polymer mixture with agitation and in the presence of at least about 0.1% by weight of a water-soluble suspending agent for said monomer(s) to form a dispersion wherein water is the continuous phase, then polymerizing the dispersion at a temperature in the range of about 30° C. to about 80° C. to convert the remaining monomer(s) to polymer, the improvement which comprises (1) applying to the internal surfaces of said reaction vessel a prime coating of a dye dissolved in an aqueous alkali metal hydroxide or ammonium hydroxide solution, said dye being selected from the group consisting of acridines, azines, oxazines, thiazines, and alkali soluble dyes having in their chemical structure one or more radicals selected from the group consisting of —OH, —COOH, —SO_3H and —SO_3Na, and wherein said radicals may be the same or different on any one dye structure, (2) applying to said prime coating a top coating of a water-soluble suspending agent, (3) polymerizing the continuous monomer phase in constant contact with said top coating, and (4) polymerizing said continuous water phase in constant contact with said prime coating after dissolving said top coating in the continuous water phase, whereby polymer buildup on said internal surfaces is substantially eliminated.

4,142,034

EPOXY RESIN COMPOSITIONS CONTAINING AN AMINE-CYANIC ACID ESTER COMBINATION CURING AGENT

Gene E. Schroll, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 10, 1978, Ser. No. 894,715
Int. Cl.[2] C08G *59/56*
U.S. Cl. 528—120 **16 Claims**

1. An epoxy composition comprising a) a poly(1,2-epoxide) and in synergistic combination, b) an organic amine having at least two amine hydrogens per molecule, and c) a cyanic acid ester compound.

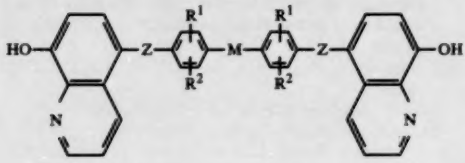
4,142,035

POLYCONDENSATES CONTAINING HYDROXYQUINOLINE END GROUPS, THEIR USE FOR THE PREPARATION OF POLYMERS CONTAINING METALS AND METAL CONTAINING POLYCONDENSATES

Karsten Idel, Krefeld; Hugo Vernaleken, Krefeld-Bockum; Dieter Freitag, Krefeld, all of Fed. Rep. of Germany; Günther Peiff, Santa Maria, Brazil, and Hans Rudolph, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

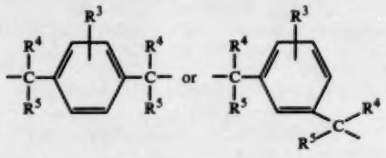
Division of Ser. No. 549,282, Feb. 12, 1975, abandoned. This application Aug. 17, 1977, Ser. No. 825,505
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407309
Int. Cl.[2] C08G *63/18, 63/46, 63/62, 63/64*
U.S. Cl. 528—177 **21 Claims**

1. A polyester of the formula



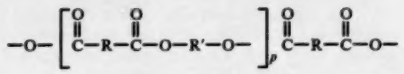
wherein

R^1 and R^2 are identical or different and denote hydrogen, (C_1–C_4)-alkyl, phenyl or halogen and Z is CH_2, CH—CH_3, an isoalkylidene radical with 3 to 5 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 15 carbon atoms, or a radical of the formula



in which

R^4, R^5 and R^3 are identical or different alkyl radicals with 1 to 5 carbon atoms, and M is a segment of the formula



wherein

R and R' are identical or different and are C_2–C_{12}-alkylene which can be interrupted by —O— or cyclohexylene, C_5–C_{15} cycloalkylene, C_8–C_{12} arylenedialkylene, C_6–C_{12} arylene and C_{13}–C_{15} alkylidene diphenylene and p is an integer between 2 and 50.

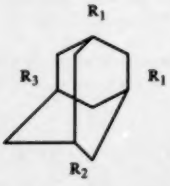
4,142,036

POLYPHENYLCARBOXYLIC ACID ADAMANTANE COMPOUNDS AND POLYMERS PREPARED THEREFROM

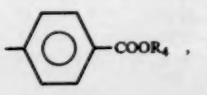
Allen I. Feinstein, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 1, 1976, Ser. No. 691,772
Int. Cl.[2] C08G *63/18, 63/66, 69/26, 69/32*
U.S. Cl. 528—183 **27 Claims**

1. A polyphenylcarboxylic acid adamantane compound of the general formula



wherein R_1 is selected from the group consisting of



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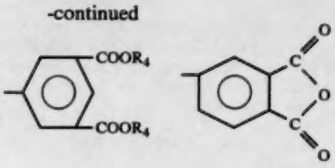


R_2 and R_3 are individually selected from the group consisting of hydrogen, an alkyl radical of 1 to 4 carbon atoms, a phenyl radical, a biphenyl radical, and a naphthyl radical, R_4 is hydrogen or an alkyl group of 1 to 24 carbon atoms.

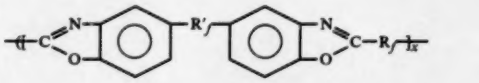
4,142,037

READILY CURABLE FLUOROCARBON ETHER BIBENZOXAZOLE POLYMERS

Robert C. Evers, Dayton, and Tonson Abraham, Kettering, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 21, 1977, Ser. No. 863,026
Int. Cl.[2] C08G *65/40*
U.S. Cl. 528—210 **7 Claims**

1. A perfluoroalkylene ether bibenzoxazole polymer consisting essentially of recurring units having the following structural formula:



wherein R'_f is $(CF_2)_3CH_2CH_2(CF_2)_3$ or $(CF_2)_3CH{=}CH(CF_2)_3$; R''_f is $(CF_2)_2O(CF_2)_5O(CF_2)_2$, $(CF_2)_2OCF_2CFO(CF_2)_2OCFCF_2O(CF_2)_2$, $(CF_2)_2O(CF_2)_2{-}O(CF_2)_2O(CF_2)_5O(CF_2)_2$, or $(CF_2)_2O(CF_2)_2O(CF_2)_2$; R_f is $CF(OCF_2CF)_a{-}O(CF_2)_5O(CFCF_2O)_bCF$, where (a + b) equals 4 or 5, $CF(OCF_2CF_2)_cO(CF_2)_5{-}O(CF_2CF_2O)_dCF$, where (c + d) equals 5 or 6, $CFO(CF_2CF_2O)_8CF$, $CF_2O(CF_2)_2{-}OCF_2$, $(CF_2)_4O(CF_2)_2OCF_2$, $(CF_2)_4O(CF_2)_4O(CF_2)_4$, $Y(CFCF_2O)_e(CF_2)_4{-}(OCF_2CF)_eY$, where Y is $(CF_2)_4O{-}$ or $CFOCF_2CF_2O{-}$

and e is an integer from 1 to 5, inclusive, or $CF_3(OCF_2CF_2)_f O(CF_2)_8O(CF_2CF_2O)_gCF_2$, where (f+g) equals 4 or 7; x equals 0.05 to 1, y equals zero to 0.95, and (x+y) equals 1; and n is equal to the number of recurring units.

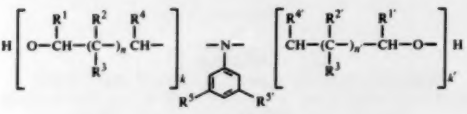
4,142,038
ACCELERATOR MIXTURE FOR UNSATURATED POLYESTER RESIN COMPOSITIONS

Klaus Kraft, Muelheim, and Erich Eimers, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,561
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649268
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—288 **2 Claims**

1. A mixture of

A. 50 to 10% by weight, preferably 33 to 25% by weight, of an N,N-dialkanol arylamine corresponding to the formula:



in which

R^1 to R^4

and $R^{1'}$ to $R^{4'}$ represent a hydrogen atom or an optionally hydroxyl-substituted alkyl radical with 1 to 4 carbon atoms,

R^5 and $R^{5'}$ represent a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms,

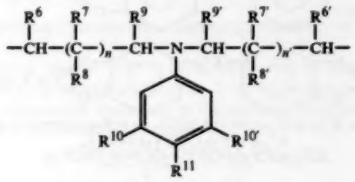
k and k' represent an integer from 1 to 5, and

n and n' = 0 or 1; and

B. 50 to 90% by weight, preferably 67 to 75% by weight of compounds or mixtures of compounds obtainable by reacting

I. N,N-dialkanol arylamines HO—D—OH

in which D represents



in which

n and n' = 0 or 1,

R^{10} and $R^{10'}$ represent a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms,

R^{11} represents an alkyl radical with 1 to 4 carbon atoms, and

R^6 to R^9 and $R^{6'}$ to $R^{9'}$ have the meanings defined above for R^1 to R^4 and $R^{1'}$ to $R^{4'}$,

II. (a) with 0.5 to 0.91 mole, based on 1 mole of (I), of a dicarboxylic acid HOOC—R^{12}—COOH

in which

R^{12} represents an alkylene radical with 2 to 10 carbon atoms, a cycloalkylene or cycloalkenyl radical with 6 or 7 carbon atoms, or an arylene radical with 6 to 10 carbon atoms optionally substituted by 1 to 4 chlorine or bromine atoms; or

(b) with 0.5 to 0.91 mole, based on 1 mole of (I), of a diisocyanate corresponding to the formula OCN—R^{13}—NCO,

in which

R^{13} represents an alkylenyl radical with 4 to 6 carbon atoms, a cycloalkylene radical with 6 to 10 carbon atoms, an optionally alkyl-substituted arylene radical with 6 to 15 carbon atoms, an alkylene-bis-(phenylene)-radical with 13 to 16 carbon atoms, or a dihydric aliphatic or cycloaliphatic radical with 7 to 12 carbon atoms; or

(c) with dicarboxylic acids (a) and diisocyanates (b) the molar ratio of dialkanol arylamines (I): (dicarboxylic acid (a) + diisocyanate (b)) having to be in the range of from 1.1:1 to 2.0:1.

4,142,039
PROCESS FOR REMOVING CATALYST RESIDUES FROM POLYOLEFINS

Geneviéve Le Brasseur, Bully Les Mines, France, assignor to Societe Chimique des Charbonnages CdF Chimie, Paris, France

Filed Jul. 6, 1977, Ser. No. 813,301
Claims priority, application France, Jul. 9, 1976, 76 621114
Int. Cl.[2] C08F 6/24
U.S. Cl. 528—496 **12 Claims**

1. A process for the purification of an olefin polymer obtained by polymerization in suspension in a medium including an inert organic diluent by means of a Ziegler-Natta catalyst, which comprises the steps of

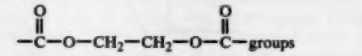
1. removing the polymer from the polymerization medium,
2. degassing the polymer in the absence of air,
3. suspending the degassed polymer in a liquid medium comprising a liquid hydrocarbon, an aliphatic alcohol having 1 to 4 carbon atoms and an organic chloride selected from the group consisting of acid chlorides and of monochlorides of a hydrocarbon selected from the group consisting of C_2 to C_6 aliphatic hydrocarbons and C_6 to C_{12} alkylaryl and alicyclic hydrocarbons, the volume ratio of said liquid hydrocarbon to said aliphatic alcohol being from about 1:1 to 20:1 and the proportional amount of said organic chloride being 0.1 to 20 mols per mol of catalyst used to prepare said polymer, the suspension being at a temperature from 30° to 65° C., whereby the polymer is deactivated, and
4. separating the deactivated polymer from the liquid medium and washing it at least once with a wash liquid selected from the group consisting of aliphatic alcohols and hydrocarbons.

4,142,040
PROCESSING POLYESTERS TO MINIMIZE ACETALDEHYDE FORMATION

Saleh A. Jabarin, Sylvania, and Elizabeth A. Lewis, Waterville, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 21, 1978, Ser. No. 898,364
Int. Cl.[2] C08G 63/70
U.S. Cl. 528—502 **4 Claims**

1. In a process for physically processing at elevated temperatures a molten molding grade saturated polyester having



in its backbone, the improvement which comprises minimizing acetaldehyde formation by excluding essentially all gaseous elemental oxygen from contact with said polymer including the step of purging oxygen-containing gases from the atmosphere in contact with said polyester by means of an inert gas, before raising the temperature of said polyester to the molten condition and physically working said polyester.

4,142,041

NOVEL N^4-ACYLOXY-2,2'-CYCLOCYTIDINES AND PROCESS FOR PREPARATION THEREOF

Tadashi Kanai; Osamu Maruyama, both of Kokybunji, and Akiji Aoki, Itsukaichi, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

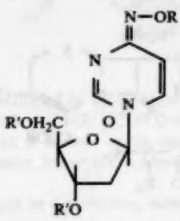
Filed Aug. 26, 1977, Ser. No. 828,114

Claims priority, application Japan, Aug. 30, 1976, 51-102576; Sep. 3, 1976, 51-104982

Int. Cl.[2] C07H *17/00*; A61K *31/70*

U.S. Cl. 536—23 4 Claims

1. A compound selected from the group consisting of N^4-Acyloxy-2,2'-cyclocytidine compounds and N^4,3',5'-tri-O-acyl-2,2'-cyclocytidine compounds of the formula



(I)

wherein the two R' moieties are both a hydrogen atom, or are the same as R which represents an acyl group derived from a fatty acid containing 1 to 46 carbon atoms or a cyclic carboxylic acid containing 5 to 11 carbon atoms, in which the ring may be substituted with one or more of a chlorine atom, a methyl group, a methoxy group or a nitro group; and the pharmaceutically acceptable salts thereof.

4,142,042

ALKENYL ETHERS FROM HIGH MOLECULAR WEIGHT POLYOLS

Paul H. Goble, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 699,178, Jun. 23, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,940

Int. Cl.[2] C07C *41/10*

U.S. Cl. 536—120 18 Claims

1. A process for preparing alkenyl ethers from polyols having more than 15 carbon atoms and a molecular weight less than 6,000 wherein the resultant alkenyl ethers are not readily distillable from the reaction mixture and the process facilitates ether product recovery, comprising the steps of: establishing a substantially uniform mixture, by stirring at elevated temperatures, the mixture consisting of alkali metal hydroxide, sufficient water as to dissolve the alkali metal hydroxide, water immiscible hydrocarbon solvent, and a polyol having more than 15 carbon atoms and a molecular weight less than 6,000 in which 3 to 6 or 10 hydroxyl groups are the sole functional groups and is free from aliphatic unsaturation; azeotropically distilling water and water immiscible hydrocarbon solvent from the system and returning the water immiscible hydrocarbon solvent to the reaction mixture to result in a uniform suspension of finely divided solids in a viscous phase; adding an alkenyl chloride, containing a chlorine atom bound directly to a saturated aliphatic carbon atom, after removal of water is near completion, in a dropwise fashion, at a rate to maintain the temperature of reaction; removing most of the water of reaction; cooling the reaction mixture; washing the reaction mixture with water; separating the organic phase; and stripping the water immiscible hyhydrocarbon solvent from the organic phase to obtain the alkenyl ether; wherein the entire process is conducted at atmospheric or subatmospheric pressures.

4,142,043

SUBSTITUTED 2-IMIDAZOLIN-5-ONES

Werner Koch, Oberwil/Bl, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

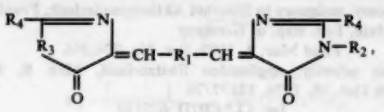
Continuation of Ser. No. 700,160, Jun. 28, 1976, abandoned, which is a division of Ser. No. 527,472, Nov. 26, 1974, Pat. No. 4,005,080, which is a continuation-in-part of Ser. No. 525,759, Nov. 21, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,380

Claims priority, application Switzerland, Nov. 28, 1973, 16697/73; Aug. 16, 1974, 11255/74

Int. Cl.[2] C07D *401/14*, *403/10*, *413/10*, *413/14*

U.S. Cl. 542—433 26 Claims

1. A compound of the formula



wherein R_1 is 1,4-phenylene, substituted 1,4-phenylene, naphthylene, substituted naphthylene, a bivalent radical of furan, thiophene, pyrrole or pyridine, each of which is unsubstituted or substituted, or a bivalent radical of benzofuran, benzothiophene, benzopyrrole or benzopyridine, in which the bonds are in the 2,5- or 2,6- or para-position, each of which is unsubstituted or substituted, wherein any substituted 1,4-phenylene, substituted naphthylene or substituted bivalent radical of furan, thiophene, pyrrole, pyridine, benzofuran, benzothiophene, benzopyrrole or benzopyridine has one or two substituents per ring independently selected from chloro, bromo, hydroxy, methyl, methoxy, ethoxy, trifluoromethyl, (C_{2-4})alkanoylamino, benzoylamino and nitro, with the proviso that with respect to the substituents selected from trifluoromethyl, (C_{2-4})alkanoylamino, benzoylamino and nitro, no more than one of any is present;

R_2 is hydrogen; (C_{1-4})alkyl; (C_{1-4})alkyl monosubstituted by chloro, bromo, hydroxy, (C_{1-4})alkoxy, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, (C_{2-4})alkanoyloxy, alkoxy (C_{1-4})carbonyl, alkoxy (C_{1-4})carbonyloxy or benzoyloxy; phenyl; phenyl substituted by one to three substituents independently selected from chloro, bromo, methyl, (C_{1-4})alkoxy, alkoxy (C_{1-4})carbonyl, cyano, nitro, hydroxy, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, (C_{2-4})alkanoylamino and alkoxy (C_{1-4})carbonylamino, with the provisos that: a) with respect to the substituents selected from (C_{1-4})alkoxy, alkoxy (C_{1-4})carbonyl, cyano and nitro, no more than two of any are present, and b) with respect to the substituents selected from hydroxy, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, (C_{2-4})alkanoylamino and alkoxy (C_{1-4})carbonylamino, no more than one of any is present; naphthyl; pyridyl-2; pyridyl-3; pyridyl-4; pyrimidyl-2; pyrimidyl-4; 2,4-dimethylpyrimidyl-6; thienyl-2; thiazolyl-2; benzothiazolyl-2 or 5-methylisoxazolyl-3;

R_3 is oxygen or a group of the formula

$>N-R_5$

wherein R_5 has one of the significances given above for R_2; and

each R_4 is, independently, phenyl or naphthyl, each of which is unsubstituted or substituted by one to three substituents independently selected from chloro, bromo, methyl, (C_{1-4})alkoxy, nitro, hydroxy, cyano, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, alkoxy (C_{1-4})carbonyl, alkoxy (C_{1-4})alkoxy (C_{1-4})carbonyl, (C_{2-4})alkanoyloxy, (C_{2-4})alkanoylamino, alkoxy (C_{1-4})carbonylamino and sulpho, with the provisos that: a) with respect to the substituents selected from (C_{1-4})alkoxy and nitro, no more than two of any are present, and b) with respect to the substituents selected from hydroxy, cyano (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, alkoxy (C_{1-4})carbonyl,

alkoxy (C_{1-4})alkoxy (C_{1-4})carbonyl, (C_{2-4})alkanoyloxy, (C_{2-4})alkanoylamino, alkoxy (C_{1-4})carbonylamino and sulpho, no more than one of any is present; pyridyl-2; pyridyl-3; pyridyl-4; pyrazinyl; thienyl-2; pyrryl-2 or pyrryl-3;

with the proviso that at least one of substituents R_1, R_2, R_3 and R_4 is a heterocycle; or a mixture of compounds of the above formula.

4,142,044

4-BENZOXAZOLYL-4'-OXADIAZOLYL STILBENE OPTICAL BRIGHTENERS

Dieter Günther, Kelkheim; Rüdiger Erckel; Schinzel, both of Hofheim, and Günter Rösch, Bad Soden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

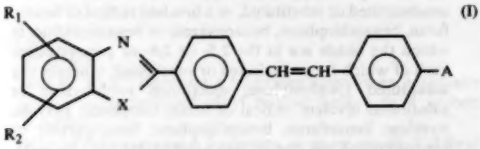
Filed Mar. 4, 1977, Ser. No. 774,396

Claims priority, application Switzerland, Mar. 9, 1976, 2918/76; Oct. 18, 1976, 13177/76

Int. Cl.[2] C07D *405/10*

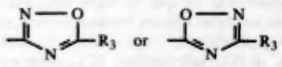
U.S. Cl. 542—464 **4 Claims**

1. A compound of the formula I

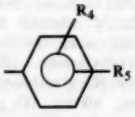


(I)

in which X is O or S, R_1 and R_2, which can be identical or different, are selected from hydrogen, fluorine, chlorine, phenyl, lower alkyl, lower alkoxy, lower dialkylamino, lower trialkylammonium, acylamino and optionally functionally modified carboxy or sulfo radicals, two adjacent radicals R_1 and R_2 together possibly represent phenylene, lower alkylene or 1,3-dioxapropylene and A represents a group of the formula



in which R_3 represents a straight chain or branched alkyl radical having from 1 to 18 carbon atoms, preferably 1 to 6 carbon atoms, which may be substituted by hydroxy, halogen, lower alkoxy, lower dialkylamino, lower alkylmercapto, chloroaryloxy, aryloxy, arylmercapto, or aryl, in the case of dialkylaminoalkyl the two alkyl groups together possibly forming a morpholine, piperidine or piperazine ring, or R_3 represents a group of the formula $-(CH_2CH_2O)_n-R$, wherein n is 1, 2, or 3 and R is hydrogen, lower alkyl, dialkylaminoalkoxyalkyl or alkylthioalkoxyalkyl, the alkyl radicals in the dialkylaminoalkoxyalkyl possibly forming together a piperidine, hexamethylene-imine, morpholine or piperazine ring, or R_3 stands for a group of the formula $-(CH_2)_m-CH=CH-R$ with m being zero or in the range of from 1 to 5, or a radical of the formula



in which R_4 and R_5, which can be identical or different, are selected from the group of hydrogen, fluorine, chlorine, phenyl, lower alkyl, lower alkoxy, (C_1–C_4)-acylamino, or possibly modified carboxy or sulfo groups, two adjacent radicals R_4 and R_5 possibly representing together a lower alkylene group, a fused benzene ring or a 1,3-dioxapropylene group.

4,142,045

CARBAMOYLALKYLUREIDO CEPHALOSPORINS

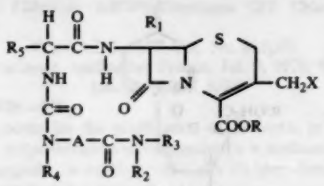
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 714,420, Aug. 16, 1976, Pat. No. 4,086,422. This application Feb. 10, 1978, Ser. No. 876,789

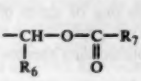
Int. Cl.[2] C07D *501/36, 501/34, 501/44*

U.S. Cl. 544—21 **7 Claims**

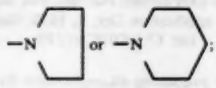
1. A compound of the formula:



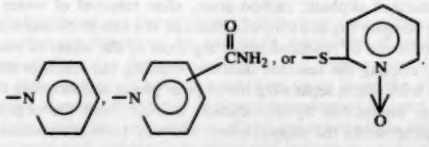
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 and R_3 are independently selected from hydrogen and straight chain alkyl of 1 to 4 carbons, or R_2 is hydrogen and R_3 is branched chain alkyl of 3 to 4 carbons, phenyl, benzyl or phenethyl, or R_2 and R_3 taken together with the N atom to which they are attached form



R_4 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_5 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 to 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono-substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_6 is hydrogen or lower alkyl; R_7 is lower alkyl; and X is hydrogen, lower alkanoyloxy,

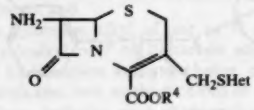


4,142,046
INTERMEDIATES FOR THE PREPARATION OF 7-ACYL-3-(SUBSTITUTED TRIAZOLYLTHIOMETHYL)CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 536,759, Dec. 27, 1974, Pat. No. 3,989,694.
This application Oct. 12, 1976, Ser. No. 731,387
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—26 10 Claims

1. A compound of the formula:



in which:

Het is 1,2,4-triazolyl or 1,2,3-triazolyl each of which is substituted with $-(CHR^2)_nCOR^3$, where R^2 is hydrogen or lower alkyl, n is zero to six and R^3 is hydroxy, lower alkoxy, amino, lower alkylamino or di(lower)alkylamino; and

R^4 is hydrogen or a protecting ester group.

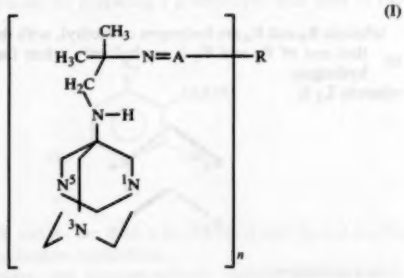
4,142,047
SUBSTITUTED TRIAZAADMANTANE COMPOUNDS

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,464
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616799
Int. Cl.[2] C07D *251/72*
U.S. Cl. 544—180 3 Claims

1. A compound of the formula

(I)



in which

n = 1, and

A represents two hydrogen atoms and R is lacking, or the group =CH— and in the latter case

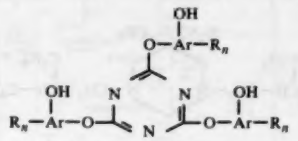
R represents , when n = 1, an alkyl radical containing 1 to 17 carbon atoms optionally substituted by a hydroxyl group.

4,142,048
PRODUCTION OF TRIS-(2-HYDROXYARYL) ESTERS OF CYANURIC ACID

Ulrich Kappler, Cologne, and Rudolf Sundermann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1976, Ser. No. 657,920
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1975, 2509780
Int. Cl.[2] C07D *251/30*
U.S. Cl. 544—219 9 Claims

1. Process for preparing a tris-(2-hydroxyaryl) ester of cyanuric acid of the formula:



wherein

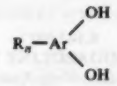
is a C_6–C_{14} aromatic radical with a hydroxyl group in the 2-position to the ether oxygen,

R is alkyl of up to 9 carbon atoms, phenyl, halogen, nitro, hydroxyl, alkoxy of up to 9 carbon atoms in the alkyl group or phenoxy, and

n is 0 or 1 or is 2, 3 or 4 in which case one R has the above-defined meaning and

each further radical R is alkyl having up to 9 carbon atoms, the radicals R optionally being different,

which comprises reacting a 1,2-dihydroxyaryl compound of the formula:



wherein

Ar is an aromatic radical and

R and n have the above defined meanings with cyanogen halide in the presence of a solvent and a hydrogen halide acceptor.

4,142,049
BENZO[G]PYRIDO[2,1-b]QUINAZOLINONES

Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 733,602, Oct. 18, 1976, Pat. No. 4,076,710, which is a continuation-in-part of Ser. No. 614,399, Sep. 18, 1975, Pat. No. 4,012,387. This application Dec. 5, 1977, Ser. No. 857,338
Int. Cl.[2] A61K *31/505;* C07D *471/04*
U.S. Cl. 544—246 3 Claims

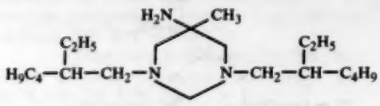
1. Ethyl-6-oxo-6H-benzo[g]pyrido[2,1-b]quinazoline-3-carboxylate.

4,142,050
SALTS OF 1,3-BIS(β-ETHYLHEXYL)-5-AMINO-5-METHYL-HEXAHYDROPYRIMIDINE

Wilhelm Kunz, and Klaus Posselt, both of Wachtberg-Villiprott, Fed. Rep. of Germany, assignors to Doll GmbH, Bonn-Bad Godesberg, Fed. Rep. of Germany

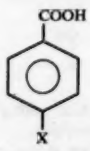
Filed Nov. 3, 1976, Ser. No. 738,210
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 2549733; Jun. 3, 1976, 2624980
Int. Cl.[2] C07D *239/04;* A61K *9/68*
U.S. Cl. 544—322 6 Claims

1. Salt of 1,3-bis-(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine of the formula



I

with an aromatic carboxylic acid of the formula



II

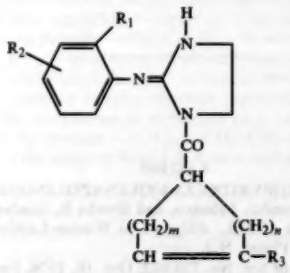
wherein X is a member selected from the group consisting of —COOH, —OH, —NH_2, —SO_3H and —SO_2NH_2.

4,142,051
ARYLAMINOIMIDAZOLINE DERIVATIVES

Rudolf Franzmair, Linz-Ebelsberg, Austria, assignor to Chemie Linz Aktiengesellschaft, Austria

Filed Apr. 20, 1978, Ser. No. 898,543
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811847
Int. Cl.[2] C07D *233/50*
U.S. Cl. 548—315 11 Claims

1. An arylaminoimidazoline derivative of the formula



(I)

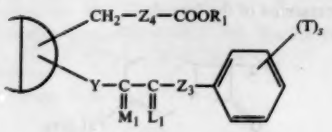
in which R_1 and R_2 denote chlorine, bromine or an alkyl group with 1 to 4 C atoms, R_3 denotes hydrogen or an alkyl radical with 1–4 C atoms and n and m each represent an integer from 1 to 3, the sum n + m being an integer from 2 to 5 inclusive, and the pharmaceutically acceptable acid addition salts of these compounds.

4,142,052
ω-ARYL-PGD COMPOUNDS

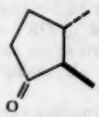
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,249
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 77 Claims

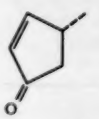
1. A prostaglandin analog of the formula



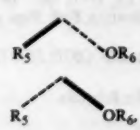
wherein D is



or



wherein Y is cis—CH=CH—, trans—CH=CH—, or —CH_2CH_2—;
wherein Z_4 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CF_2—, or
(5) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
wherein g is one, 2, or 3;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

or a mixture of

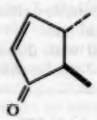
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is hydrogen or fluoro only when the other is hydrogen or fluoro;

wherein Z_3 is oxa or methylene;

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation;

with the further proviso that D is



only when Y is $-CH_2CH_2-$.

4,142,053

PROCESS FOR MANUFACTURING ALKYL-SUBSTITUTED β-RESORCYCLIC ACID ESTERS

Erich Klein; Frank Thömel, and Hartmut Struwe, all of Holzminden, Fed. Rep. of Germany, assignors to Dragoco Gerberding & Co. GmbH, Holzminden, Fed. Rep. of Germany

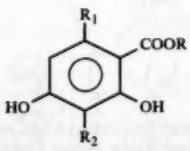
Filed Aug. 24, 1977, Ser. No. 827,427

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653177

Int. Cl.² C07C 69/88

U.S. Cl. 560—67 **11 Claims**

1. A process for preparing a β-resorcylic acid ester of the formula:



III

wherein R and R_1 are each a C_1–C_3 alkyl and R_2 is a C_1–C_3 alkyl or hydrogen, comprising:

aromatizing the correspondingly substituted dihydro-β-resorcylic acid ester by heating approximately equal molar amounts of said dihydro-β-resorcyclic acid ester and sulfuric acid in the presence of at least an approximately equal molar amount of acetic anhydride to form the corresponding diacetate;

saponifying said diacetate according to alkaline or acid methods; and

recovering said β-resorcylic acid ester.

4,142,054

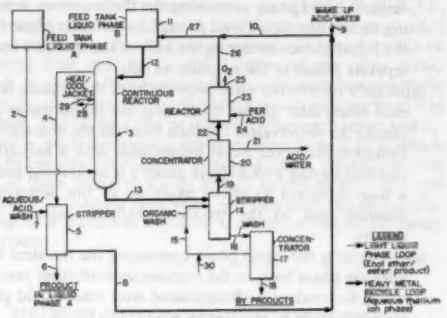
PROCESS FOR PREPARING ARYLALKANOIC ACID DERIVATIVES

Sanjay I. Amin, Kalamazoo Township, Kalamazoo County, and Jerry A. Walker, Oshtemo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

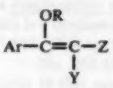
Filed Jun. 16, 1977, Ser. No. 807,031

Int. Cl.² C07C 69/76, 67/00

U.S. Cl. 560—105 **7 Claims**

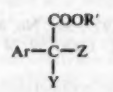


1. In a process which comprises reacting an enol ether of the formula



(III)

with trivalent thallium ions in an organic liquid containing at least one equivalent of an alcohol or water at a temperature of from about −25° C. to about reflux temperature of the mixture for a time sufficient to form a 2-aryl C_3 to C_6-alkanoate ester of the formula



(I)

wherein in each formula Ar is the aromatic moiety of a useful acid product containing from 6 to 13 carbon atoms, in which the aryl ring portion of the aromatic moiety is a phenyl, phenoxyphenyl, naphthyl or biphenylyl group bonded to the carbon atom adjacent to the carboxyl ester moiety as an aryl ring carbon;

R is C_1 to C_4-alkyl, benzyl, phenyl, tris-(C_1 to C_3-alkyl)silyl; and R′ is equal to R or is an alkyl, benzyl, or phenyl group derived from the solvent medium;

Y and Z denote the residue of a C_3 to C_6-alkanoic acid moiety with each of Y and Z being hydrogen or C_1 to C_4-alkyl, with Y and Z having a total of from one to 4 carbon atoms, and

the trivalent thallium ions needed for further reaction with enol ether are generated from a monovalent thallium salt of an organic carboxylic acid having a pKa above about 2, contained in the mixture, by providing (a) a perorganic acid having a pKa above about 2 in an amount at least about stoichiometrically equivalent to the monovalent thallium content in the mixture in the presence of (b) a reactive oxidation promoter form of a metal selected from the group consisting of at least one of manganese, ruthenium, cobalt, iridium, hafnium, osmium and neobium said non-thallium reactive metal form being provided in a sufficiently soluble form and in an amount sufficient to

promote oxidation of monovalent thallium ions to the trivalent thallium valence state,

the improvement which comprises conducting the reaction between the enol ether III with the trivalent thallium ions to form the ester product in a continuous, two liquid phase manner wherein the enol ether containing liquid phase is contacted with the trivalent thallium and non-thallium reactive metal containing phase to form the ester product 1 which remains essentially in the same liquid phase as the enol ether reactant, and the thallium ions remain in the original liquid phase containing the thallium ions; separating the organic liquid enol ether/ester product phase from the liquid phase containing the bulk of the thallium ions at separate points in the reaction vessel;

separately recovering ester product from the organic liquid enol ether/ester phase; contacting the liquid phase containing the monovalent thallium ions and the non-thallium oxidation promoter metal compounds with a percarboxylic acid having a pKa above about 2 in an amount and for a time sufficient to effect oxidation of the monovalent thallium ions to the trivalent thallium valence state therein;

and recycling the liquid phase containing the trivalent thallium ion phase back to the continuous enol ether reaction vessel for contact with additional enol ether liquid phase for production of more ester product.

4,142,055

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH AN ACRYLIC ACID ESTER

Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Aston, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

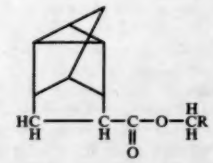
Filed Jul. 1, 1977, Ser. No. 812,209
Int. Cl.[2] C07C *69/74*
U.S. Cl. 560—116 **9 Claims**

1. Process for the catalytic codimerization of norbornadiene with an acrylic acid ester comprising:

(a) contacting norbornadiene and an acrylic acid ester, wherein the ester is RCH_2O— and R is an H or an alkyl containing one to ten carbon atoms, in the presence of a catalytic amount of a two-component homogeneous catalytic system consisting of nickel acetylacetonate and an alkyl aluminum chloride selected from the group consisting of diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride:

(b) having the contacting occurring at a temperature within the range from between about −20° C. to about 100° C.; and

(c) continuing the contacting until a norbornadiene-acrylic acid ester codimer having the following structure



is prepared.

4,142,056

PROSTAGLANDINS AND METHODS FOR PREPARING SAME

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 221,058, Jan. 26, 1972, Pat. No. 4,031,129.
This application Feb. 25, 1977, Ser. No. 772,018
Int. Cl.[2] C07C *69/74*
U.S. Cl. 560—121 **1 Claim**

1. A method for preparing 2-(6'-carbomethoxyhexyl)-2-cyclopenten-1-one which comprises:

subjecting octadiene to hydroboration in the presence of iodine to form 8-iodo-1-octene

reacting 2-methoxy-2-cyclopentene-1-one with a Grignard reagent prepared by reacting 8-iodo-1-octene with magnesium turnings and dehydrating the resulting product to obtain the olefin, 2-(1'-oct_ne-8-yl)-2-cyclopentene-1-one

epoxidizing the said olefin with one molar equivalent of m-chloroperbenzoic acid (at low temperature) at about 0° C.,

cleaving the resulting epoxide with periodic acid to obtain the corresponding aldehyde oxidizing the said aldehyde to the corresponding acid and

esterifying the said acid with diazomethane to yield 2-(6'-carbomethoxyhexyl)-2-cyclopenten-1-one.

4,142,057

PROCESS FOR PREPARING DIGLYCOLIC ACIDS

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 711,933, Aug. 5, 1976, Pat. No. 4,070,375.
This application Aug. 4, 1977, Ser. No. 821,685
Int. Cl.[2] C07C *51/24*
U.S. Cl. 562—525 **5 Claims**

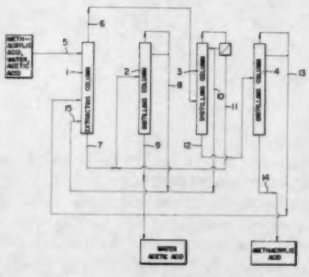
1. A process for preparing diglycolic acids which comprises the steps of (1) contacting carbon monoxide with formaldehyde and a 1,2-glycol in the presence of a catalytic amount of hydrogen fluoride to prepare a 1,4-dioxan-2-one; and (2) heating the dioxanone product of step (1) in an aqueous reaction medium in the presence of a catalytic amount of a dehydrogenation catalyst at a temperature of from about 150° C. to about 250° C.

4,142,058

METHOD OF SEPARATING AND PURIFYING METHACRYLIC ACID

Hiroshi Matsumura; Takashi Tokutomi, and Hideo Matsuzawa, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,809
Int. Cl.[2] B01D *3/14, 11/04;* C07C *57/04*
U.S. Cl. 562—600 **5 Claims**



1. A method for separating and purifying methacrylic acid which comprises the steps of:

bringing an aqueous solution of methacrylic acid which also contains acetic acid into contact under counter-current

flow with a mixed solvent containing methyl methacrylate and toluene in a ratio of from 5:5 to 1:9 by weight, to extract substantially all said methacrylic acid into said mixed solvent in an extraction phase; and

separating and purifying said methacrylic acid by distillation of said extraction phase.

4,142,059

SPRAY DRYING SODIUM AND POTASSIUM 2-ETHYLHEXANOATE

James M. Greene; Sigmund A. Schildcrout, and Gary D. Zintgraff, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 672,910, Apr. 2, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,288

Int. Cl.[2] C07C *51/42*

U.S. Cl. 562—606 **4 Claims**

1. A process for preparing a purified non-tacky crystalline salt selected from sodium 2-ethylhexanoate and potassium 2-ethylhexanoate comprising spray drying an aqueous solution containing from about 40 percent by weight to about 70 percent by weight of sodium 2-ethylhexanoate or potassium 2-ethylhexanoate respectively in a spray dryer having a temperature range of about 60° C. to about 160° C., and a feed rate of from about 50 to about 500 ml. per minute, and collecting the purified crystalline salt having a moisture content ranging from about 0.5 percent by weight to about 5.0 percent by weight therefrom.

4,142,060

TELOMERIZATION PROCESS USING SULFONATED TRIARYLPHOSPHINE AND TRANSITION METAL

Emile Kuntz, Lyons, France, assignor to Rhone-Poulenc Industries, Paris, France

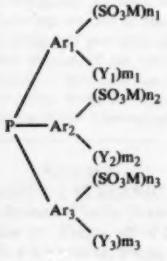
Filed Jul. 21, 1977, Ser. No. 817,800

Claims priority, application France, Jul. 27, 1976, 76 22824

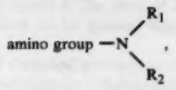
Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—840 **41 Claims**

1. A process for telomerizing dienes which comprises the step of reacting a diene with a telomerizing compound containing at least one mobile hydrogen atom, said telomerizing compound being water, in the presence of a water-soluble catalytic system comprising at least one water-soluble phosphine having the following formula (I):



wherein Ar_1, Ar_2 and Ar_3 each represent an aryl group having from 6 to 10 carbon atoms, which may be alike or different from each other; Y_1, Y_2 and Y_3, which may be alike or different from each other each represent an alkyl group containing 1 to 4 carbon atoms, an alkoxy group containing 1 to 4 carbon atoms, a halogen, cyano-, nitro-, or hydroxy radical or an



wherein R_1 and R_2, which may be alike or different from each other each represent an alkyl group containing 1 to 4 carbon atoms; M represents a cation which is able to form water-soluble compounds of formula (I) selected from the group consisting of a proton, a cation derived from an alkali metal or an alkaline earth metal, ammonium, a group $N(R_3R_4R_5R_6)+$, wherein R_3, R_4, R_5 and R_6 each represent hydrogen or an alkyl group containing 1 to 4 carbon atoms and may be alike or different from each other, and a cation of any other metal, which is able to form water-soluble salts with benzosulfonic acids; m_1, m_2 and m_3 each represent a whole number from 0 to 5 which may be the same or different from each other and n_1, n_2 and n_3 each represent a whole number from 0 to 3, which may be the same or different from each other, whereby at least one of these numbers n_1, n_2 and n_3 equals at least one and further comprising a compound selected from the group consisting of a transition metal or a transition metal-containing compound.

4,142,061

HYDROFORMYLATION OF OLEFINS USING AZOXY-DENTATED LIGANDS

John B. Wilkes, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

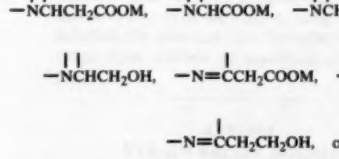
Continuation-in-part of Ser. No. 479,345, Jun. 14, 1974, Pat. No. 4,096,191, which is a continuation of Ser. No. 150,862, Jun. 1, 1971, abandoned, which is a division of Ser. No. 857,547, Sep. 12, 1969, Pat. No. 3,647,845. This application Dec. 12, 1977, Ser. No. 859,629

The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.[2] C07C *27/22*

U.S. Cl. 568—909 **5 Claims**

1. Process for the addition of a $-CH_2OH$ group to a hydroformylatable organic compound containing olefinic unsaturation which comprises contacting said compound with carbon monoxide and hydrogen at a temperature in the range from about 100° C. to 225° C. in the presence of a hydroformylation catalyst consisting essentially of a cobalt carbonyl complex compound wherein said catalyst is stabilized by the presence of an ethylenediamine carboxylic acid, salt or ester containing from 1 to 5 azoxy-dentate functional groups selected from

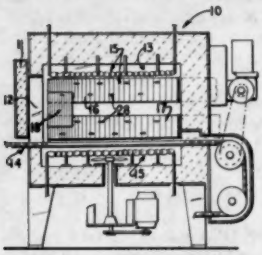


where M is hydrogen, or an alkali metal, alkaline earth metal or ammonium cation and the open valences of the functional groups are satisfied by bonds to hydrogen or hydrocarbon radicals; and wherein the ethylenediamine carboxylic acid, salt or ester is present in an amount below 0.5 mcl of the ligand per mol of cobalt.

4,142,062
MATERIAL HEATING FURNACE AND HEATING ELEMENT

Hobart L. Wentworth, Barrington, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Continuation of Ser. No. 627,369, Oct. 30, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,154
Int. Cl.[2] H05B *3/06, 3/20*
U.S. Cl. 13—25 **8 Claims**



1. In an electric heating furnace including a hollow body having walls of refractory material defining a chamber for receiving material to be heated therein and wherein a heating element includes an elongated heating strip of electrically conductive resistance material, said strip having width and being many times wider than its thickness for providing a heat radiating surface, said strip having corrugations therein extending transversely of the length of the strip and being mounted in the chamber spaced from a wall thereof with its heat radiation surface facing into the chamber and including a flat connector strip secured to an end of said heating strip and extending at right angle to the length of said heating strip for conducting electrical current to said heating strip, an improved heating element in which:

said corrugated heating strip having a plurality of spaced parallel slots cut therein, each slot extending from the end of the heating strip in a direction lengthwise of the strip and perpendicular to the currugations,

said slots each having a length which is many times greater than the thickness of said heating strip and extending partially along the length of said heating strip thereby separating the end of the heating strip into a plurality of spaced parallel corrugated portions, and

said connector strip being welded to the end of each of said spaced parallel corrugated portions of said heating strip,

whereby stresses are decreased on the welded connection between said connector strip and the heating strip which would otherwise arise from thermal expansion of the heating strip relative to the connector strip.

4,142,063
HIGH-FREQUENCY ELECTRIC FURNACE

Jean-Yves Boniort, Limours; Claude Brehm, Montrouge, and Yves Floury, Villebon sur Yvette, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 23, 1978, Ser. No. 889,306
Claims priority, application France, Mar. 29, 1977, 77 09311
Int. Cl.[2] H05B *5/00*
U.S. Cl. 13—27 **9 Claims**

1. A high-frequency electric furnace comprising:

a tubular induction heater disposed vertically and made of a material which is oxidizable at high temperature;

a toroidal chamber enclosing said heater, the chamber being constituted by an assembly of superposed wall-forming members including: a horizontal lower plate; an outer tube means and an inner tube means which are substantially co-axial and rest vertically on said lower plate with the heater disposed co-axially between the tube means; and an upper plate resting horizontally on the tube means; said upper and said lower plates each being provided with an opening which opens to the bore of the inner tube means to enable objects to be passed through the heater for heating;

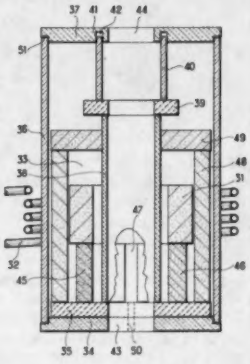
an induction coil disposed around the outer tube means for receiving high-frequency electric current to induce heating eddy currents in the heater;

and means for introducing an inert gas into said chamber at sufficient pressure for the gas contained in the chamber to escape through gaps between the contact surfaces of said superposed wall-forming members; the improvement wherein:

said inner tube means comprises an assembly of:

a first inner tube made of a first refractory material and resting on the lower plate and extending less than the axial extent of said outer tube means;

a horizontally disposed washer resting on the upper end of the first inner tube; and



a second inner tube resting on the washer and whose upper end is engaged in a groove provided in the upper plate and sufficiently deep for a gap to remain between the upper end of the second inner tube and the base of the groove at ambient temperature; the second inner tube, the upper plate and the outer tube means being made of a second refractory material having both a maximum operation temperature and a coefficient of expansion which are lower than those of the first refractory material, differential expansion during heating between the first inner tube and the other wall-forming members being accommodated longitudinally by the depth of said groove and radially by sliding on the washer, whereby the gas-passing gaps between the contact surfaces of the wall-forming members remain of substantially constant size throughout the temperature range from ambient to maximum operating temperature.

4,142,064
STRAIN RELIEF BUSHING

Jack W. Thomsen, La Grange Park, Ill., assignor to Weckessar Company, Inc., Ill.

Filed Jun. 16, 1977, Ser. No. 807,249
Int. Cl.[2] H01B *17/26;* **F16L** *5/00*
U.S. Cl. 174—153 G **4 Claims**

1. A strain relief bushing of molded plastic dielectric material adapted to insulate an electric cord while being contained within a complementary circular aperture formed in a supporting panel wherein the improvement comprises:

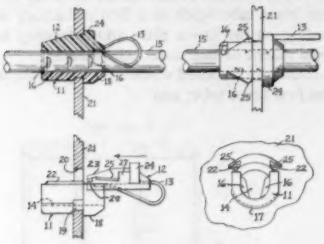
(a) a U-shaped body of a size to be positioned in a portion of the circular aperture formed in the supporting panel and provided with an axially extending cord receiving trough,

(b) a wedge member arcuated throughout its length and adapted to be placed upon the cord when held in the trough of said U-shaped body and slidably moved upon

the free ends of said U-shaped body and into the remaining opening portion of the circular aperture formed in the supporting panel,

(c) said arcuated wedge member having a front to rear tapered top wall supporting a pair of radially extending arcuated and tapered flexible wing tabs having a portion of their extremities extending over and beyond the free ends of said U-shaped body portion,

(d) said wing tabs resiliently flexing in a downward direction about said arcuated wedge member as the same is slidably moved upon the cord held in said trough provided by said



U-shaped body and into the circular aperture with said tabs engaging behind the wall defining such aperture so as to restrict withdrawal of the strain relief bushing out of such circular aperture, and

(e) a plurality of barbs formed in the inner wall of said U-shaped body defining said trough with said barbs increasing in width so as to reduce the width of said trough in the direction of the bottom thereof and with said barbs offset longitudinally of each other throughout the length of said trough so as to grip the cord as the same is depressed into said trough by the slidable movement of said arcuated wedge member relative thereto.

4,142,065

METHOD FOR BIT-SYNCHRONOUS TRANSMISSION OF DATA

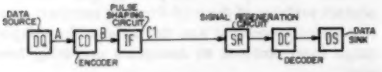
Armin Tannhäuser, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 10, 1975, Ser. No. 585,494

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428370

Int. Cl.[2] H04L *7/02*

U.S. Cl. 178—69.1 **3 Claims**



1. A method for the bit-synchronous transmission of binary data comprising the steps of:

generating said binary data having a plurality of first and second binary bits representing, respectively, first and second binary conditions,

producing a first assigned signal corresponding to a first binary bit of said binary data, said first assigned signal having an amplitude during the first half of the duration of said first binary bit which exceeds a predetermined first threshold value and an amplitude during the second half of the duration of said first binary bit which exceeds a predetermined second threshold value, the amplitude of said first assigned signal being within said first and second threshold values for the durations of the other bits constituting said binary data, said first assigned signal having a zero value at one-half of the duration of said first binary bit and at the end of the duration of said first binary bit,

producing a second assigned signal corresponding to a second binary bit, said second assigned signal being the inverse of said first assigned signal and having an amplitude during the first half of the duration of said second binary bit which exceeds said predetermined second threshold value and at an amplitude during the second half of the duration of said second binary which exceeds said predetermined first threshold value, the amplitude of said second assigned signal being within said first and second threshold values for the durations of the other bits constituting said binary data, said second assigned signal having a zero value at one-half of the duration of said second binary bit and at the end of the duration of said second binary bit,

forming a composite signal by superposing in sequence said first and second assigned signals in accordance with the bit sequence of the binary data being transmitted and

transmitting said composite signal.

4,142,066

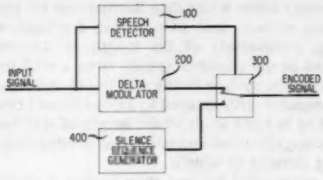
SUPPRESSION OF IDLE CHANNEL NOISE IN DELTA MODULATION SYSTEMS

Syed V. Ahamed, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1977, Ser. No. 864,500

Int. Cl.[2] H03K *13/22*; H04B *15/00*

U.S. Cl. 179—1 P **8 Claims**



1. A delta modulation system including a delta modulator for encoding an analog input signal, the improvement comprising:

a speech detector for ascertaining periods of silence in said input signal;

a silence sequence generator; and

a switch responsive to said delta modulator and to said silence detector for selecting, under control of said speech detector, the output signal of said delta modulator or the output signal of said silence sequence generator.

4,142,067

SPEECH ANALYZER FOR ANALYZING FREQUENCY PERTURBATIONS IN A SPEECH PATTERN TO DETERMINE THE EMOTIONAL STATE OF A PERSON

John D. Williamson, P.O. Box 763, Theodore, Ala. 36582

Continuation-in-part of Ser. No. 806,497, Jun. 14, 1977, Pat. No. 4,093,821. This application Apr. 11, 1978, Ser. No. 895,375

Int. Cl.[2] G10L *4/00*

U.S. Cl. 179—1 SC **15 Claims**

1. A speech analyser for determining the emotional state of a person, said analyser comprising:

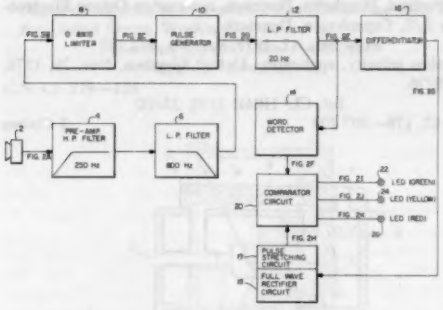
(a) FM demodulator means for detecting a person's speech and producing an FM demodulated signal therefrom;

(b) word detector means coupled to the output of said FM demodulator means for detecting the presence of an FM demodulated signal;

(c) null detector means coupled to the output of said FM demodulator means for detecting nulls in the FM demodulated signal and for producing an output indicative thereof;

(d) output means coupled to said word detector means and said null detector means, wherein said output means is enabled by said word detector means when said word

detector means detects the presence of an FM demodulated signal and wherein said output means produces an



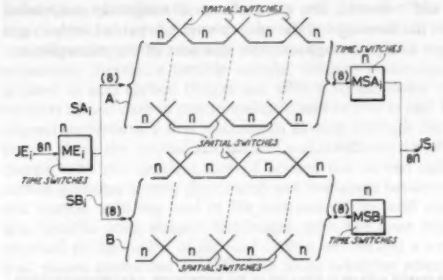
output indicative of the presence or nonpresence of a null in the FM demodulated signal.

4,142,068

TIME-DIVISION AND SPATIAL CONNECTION NETWORK

Pierre Charransol; Jacques Hauri, and Claude Athénes, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 17, 1977, Ser. No. 807,687
Claims priority, application France, Jun. 22, 1976, 76 18928
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 AT **2 Claims**



1. A time division and spatial connection network for switching signals digitalized with 8 bits from an integer number 8 × n of input junctions to 8 × n output junctions, said network comprising:

an input time switching stage connected to said input junctions, delivering said digitalized signals in series mode onto 8 pluralities of n first outputs, and having a given switching capacity;

a first spatial switching branch divided into 8 identical first switching planes; said 8 first switching planes being respectively connected to said 8 pluralities of first outputs and each of said first switching planes having a blocking capacity equal to that of an n × n square matrix;

a second spatial switching branch divided into k second switching planes, k being an integer comprised between 1 and 8; said k second switching planes being identical to said first switching planes and being respectively connected to k of said 8 pluralities of first outputs in parallel with k of said first switching planes;

a first output time switching stage connected to said first spatial switching branch, having said given switching capacity, and connected to said output junctions for delivering onto said output junctions said digitalized signals; and

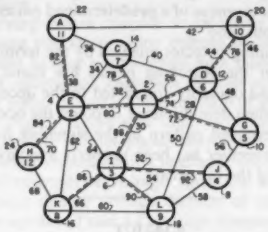
a second output time switching stage connected to said second spatial switching branch, having said given switching capacity, and connected in parallel to said output junctions for delivering only said output junctions said digitalized signals.

4,142,069

TIME REFERENCE DISTRIBUTION TECHNIQUE

Harris A. Stover, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 20, 1977, Ser. No. 808,010
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **26 Claims**



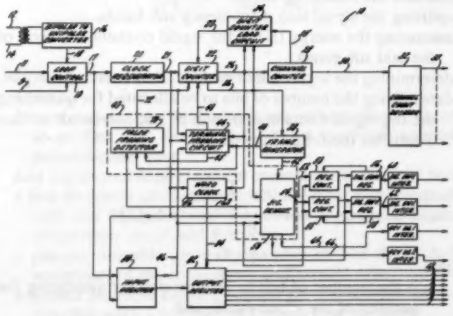
1. A time reference distribution system for distributing an accurate time reference to a plurality of nodes of an electronic network, paths connecting each node to one or more neighboring nodes, which distribution system can also be used to synchronize the network, each node including: a local clock, means for measuring the local clock's time error relative to a system master clock, means for weighting (where such weighting may include a selection function) the paths connecting the nodes over which the time reference is distributed through the network, and means for correcting the time error of the local clock so that said means for measuring the local clock's time error is not affected by the correction of the clock error at any other node and so that the time reference distribution system does not contain any closed distribution paths.

4,142,070

FALSE FRAMING DETECTOR

Steven W. Landauer, Des Plaines, and Harry J. Dyke, Oak Forest, both of Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed Dec. 27, 1977, Ser. No. 864,926
Int. Cl.[2] H04J *3/06*; H04L *7/00*
U.S. Cl. 179—15 BS **12 Claims**



1. In a pulse code modulated, time multiplexed data receiver for receiving a serially transmitted bit stream of data bits divided into channel words and frames with alternate frames characterized by a terminal frame bit and signaling frame bit,

which receiver includes digit and channel counter means for counting the data bits and channel words within each frame and adapted to be synchronized with the frame of the transmitted bit stream, a framing circuit comprising:

(a) a terminal framing circuit including means for locally generating a terminal frame bit pattern, a comparator for comparing the locally generated terminal frame bit pattern with a predetermined pattern of the terminal frame bits of the bit stream and searching means enabled by the comparator to search for a terminal frame bit and to synchronize the digit and channel counter means with the frames of the transmitted bit stream;

(b) a signaling demultiplexer including decoding means for locating occurrences of a predetermined pattern of signaling frame bits; and

(c) a false framing detector enabled by the terminal framing circuit after the searching means has found a terminal frame bit and operably connected to the decoding means of the signaling demultiplexer to count the occurrences of the predetermined pattern of the signaling frame bits to assure the receiver has been properly synchronized with the frame of the bit stream.

4,142,071

QUANTIZING PROCESS WITH DYNAMIC ALLOCATION OF THE AVAILABLE BIT RESOURCES AND DEVICE FOR IMPLEMENTING SAID PROCESS

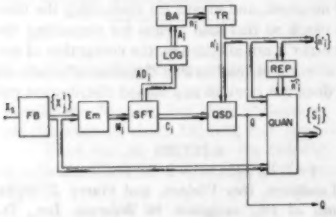
Alain Croisier, Larchmont, N.Y.; Daniel Esteban, and Claude Galand, both of LaGaude, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 895,204

Claims priority, application France, Apr. 29, 1977, 77 13995

Int. Cl.[2] H04J *6/02;* **H03K** *13/01*

U.S. Cl. 179—15.55 R **12 Claims**



1. A process for quantizing a signal, the spectrum of which extends over a given band of frequencies, characterized in that it includes the following steps:

splitting the signal into p frequency sub-bands,

measuring the energy (E) of the signal contained in each of the said sub-bands,

determining the logarithm of each of said measured energies,

determining the number of bits to be allocated for quantizing the log signal contained in each of said sub-bands so that it satisfies the following relation:

$$n_i = \frac{N - \log \prod_{j=1}^{p} E_j}{p} + \log E_i$$

where

n_i is the number of bits to be allocated for quantizing the samples of the i^{th} sub-band, and

N is the total number of bits to be allocated for quantizing the p sub-bands,

using n_i for controlling the adjustment of the quantizing step of the i^{th} sub-band,

quantizing the signal contained in each of said sub-bands.

4,142,072

DIRECTIONAL/OMNIDIRECTIONAL HEARING AID MICROPHONE WITH SUPPORT

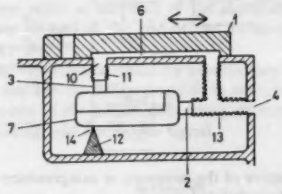
Ole Berland, Horsholm, Denmark, assignor to Oticon Electronics A/S, Copenhagen, Denmark

Filed Sep. 12, 1977, Ser. No. 832,187

Claims priority, application United Kingdom, Nov. 29, 1976, 49605/76

Int. Cl.[2] H04R *1/38, 25/00*

U.S. Cl. 179—107 FD **2 Claims**



1. A hearing aid with an outer front opening and an outer rear opening which are connectable to the respective sides of a membrane in a microphone within the housing of the hearing aid for directional use, and with mechanical means for closing the outer rear opening for omnidirectional use, in which said closing means is formed and arranged so as in the closing position thereof to establish a narrow acoustically dimensioned sound passageway from the outer opening not closed to the side of the membrane corresponding to the closed outer opening, and wherein the microphone is resiliently suspended within the housing and the microphone is provided with a rigid support at a place opposite the rear port of the microphone.

4,142,073

TEMPERATURE-STABLE ELECTRET MICROPHONE WITH EMBOSSED, SMALL AREA, ELECTRET

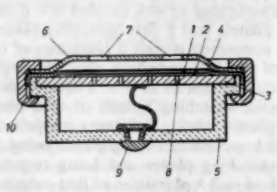
Nils-Erik Agnéus, Karlskrona, and Hans-Eric Månsson, Nättraby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 6, 1978, Ser. No. 883,693

Claims priority, application Sweden, Mar. 23, 1977, 7703355

Int. Cl.[2] H04R *19/04*

U.S. Cl. 179—111 E **1 Claim**

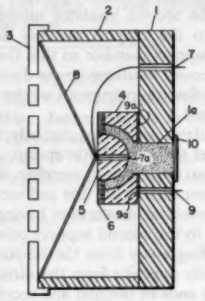


1. Temperature-stable electret microphone with a metallized plastic film stretched over a polarized plastic film and fastened to an underlying fixed electrode, the polarized plastic film being on at least one side embossed with a relief pattern, having a smaller area than the underlying fixed electrode and being concentrically fixed to this by the metallized plastic film.

4,142,074
MICROPHONE

Charles K. Corbett, Bethesda, Md., assignor to The United States of America as represented by the Attorney General of the United States, Washington, D.C.

Filed Oct. 29, 1957, Ser. No. 693,217
Int. Cl.[2] H04R *21/02*
U.S. Cl. 179—124 **2 Claims**

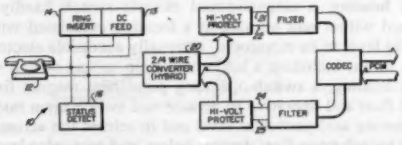


1. A sound actuated device comprising a non-metallic cylindrical case having a closed end provided with a coaxial aperture extending therethrough, a carbon cup having a hemispherical recess with a coaxial aperture extending therethrough, a flexible wire loop, the said carbon cup being affixed within the said case in such manner that the apertures of both cup and case are in alignment with the said wire loop interposed between the abutting surfaces of the cup and the end of the case and disposed about the aperture, a carbon button of curvature complimentary to the recess of the said cup and in fixed aligned suspension therein, a flexible annular retainer concentrically secured to said carbon button and affixed to the radial outer surfaces of said carbon cup to maintain said button in said fixed aligned suspension, a first lead means passing through the said button along the central axis thereof and conductively affixed therein with the terminus thereof beyond the curved surface, carbon granules loosely distributed and contained between the said button, said cup and in the aperture of the said case, a non-metallic cone shaped diaphragm with the apex thereof attached to the center of the said carbon button and a second lead means connected to said wire loop; whereby sound induced vibrations on the diaphragm result in the reciprocal movements of the carbon button which in turn compresses and decompresses the carbon granules, thus inducing a variation of resistance between the first and second lead means.

4,142,075
INTERFACE CIRCUIT AND METHOD FOR TELEPHONE EXTENSION LINES

Wilfred W. Olschewski, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Oct. 11, 1977, Ser. No. 841,009
Int. Cl.[2] H04B *1/58;* H04Q *1/28*
U.S. Cl. 179—170 NC **21 Claims**



1. An interface circuit for transmitting telephone signals between an electronic switching system and a two wire cable connected to a telephone set, said telephone set having a telephone set resistance coupled across the two wires of said two wire cable, said two wire cable having a cable resistance, said telephone set producing a microphone voltage signal transmitted along said two wire cable, said electronic switching system producing an audio frequency signal, said interface circuit comprising in combination:

(a) means for producing a substantially constant DC reference current;

(b) current source means connected to said two wire cable for producing a substantially constant DC current component in said two wire cable in response to said DC reference current and an AC current component in said two wire cable in response to said audio frequency signal, said AC current component producing a corresponding AC voltage component between the two wires of said two wire cable;

(c) amplifying means coupled to said two wire cable for amplifying said microphone voltage signal, said amplifying means having a sufficiently high input impedance to prevent substantial reduction of the said microphone voltage signal due to voltage division of said microphone voltage signal across said input impedance, said cable resistance, and said telephone set resistance; and

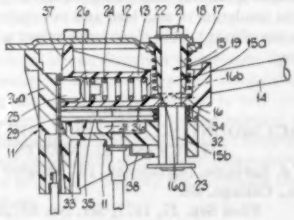
(d) there being no termination resistance substantially reducing said microphone voltage signal and said AC voltage component due to voltage division of said microphone voltage signal and said AC voltage component across said telephone set resistance, said cable resistance, and said termination resistance;

whereby, said AC voltage component and said microphone voltage signal are substantially independent of the distance between the points of said two wire cable to which said amplifying means and said telephone set are respectively coupled.

4,142,076
ELECTRICAL SWITCH

Stephen J. Bird, Burnley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 26, 1977, Ser. No. 790,943
Claims priority, application United Kingdom, Apr. 27, 1976, 16953/76
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—4 **3 Claims**



1. An electrical switch comprising:

a body;

a rotor mounted on the body for movement relative thereto about first and second spaced and generally mutually perpendicular axes;

first and second fixed electrical contacts carried by the body;

a first moveable contact carried by the rotor and engageable with said fixed electrical contacts in one angular position of the rotor about said first axis;

a plunger movable generally parallel to said first axis by movement of the rotor about said second axis;

a second movable contact carried by the plunger and engageable with a further fixed contact on the body;

a conductive wire spring including a pair of resilient limbs which in a rest position of the spring, are resiliently biassed in opposite directions respectively into engagement with said first fixed contact, said rotor including means for biassing one of said limbs, one of said limbs being movable

against its inherent bias by the means during movement of the rotor about the first axis, for engaging said second fixed contact whereby the spring bridges said first and second fixed contacts; and

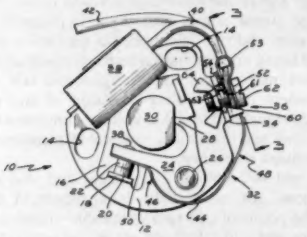
means for providing permanent electrical connection between said first fixed contact and said second movable contact said means for providing comprising said wire spring and plunger.

4,142,077

BREAKER POINT ASSEMBLY

Joseph S. Lemanski, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Jun. 22, 1977, Ser. No. 809,001
Int. Cl.[2] H01H *1/00*; H01R *15/12*
U.S. Cl. 200—19 A **5 Claims**



1. In a breaker point assembly of the type including a stationary contact and a pivotable breaker arm carrying an electrical contact for periodic make and break contact with said stationary contact, the improvement comprising:

a unitary breaker spring of spring steel having a curved intermediate portion with two arm portions extending outwardly therefrom, one arm portion being connected to the breaker arm and the other arm portion including an inturned clamp section adapted to receive and retain therein at least one electrical lead for mechanical and electrical connection therewith

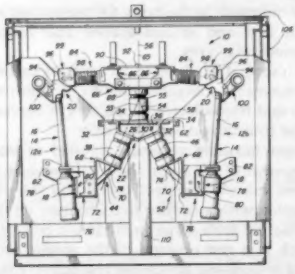
and means for holding said clamp section in gripping relation on the insulation of said lead and maintaining the conductor wire of said lead in electrical contact with said breaker spring.

4,142,078

COMPACT MOUNTING ASSEMBLY FOR ELECTRICAL SWITCHING ELEMENTS

Arvydas J. Kalvaitis, Northbrook, Ill., assignor to S & C Electric Co., Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,238
Int. Cl.[2] H01H *31/02*
U.S. Cl. 200—48 R **31 Claims**



1. An assembly for mounting together in opposed fashion a pair of electrical switching elements, each of which has a first and a second support point, which assembly comprises:

(a) a central support member;

(b) first insulator means for partially supporting one element, the first insulator means having a first end mounted to the support member and, extending away therefrom, a second end to which the first support point of one of the elements is attachable;

(c) second insulator means for partially supporting the other element, the second insulator means having a first end mounted to the support member and, extending away from the support member so that the second ends of the first and second insulator means diverge, a second end to which the first support point of the other element is attachable; and

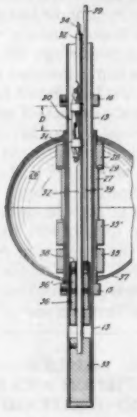
(d) third insulator means for partially supporting both elements, the third insulator means having a first end mounted to the support member diametrically remote from the first ends of the first and second insulator means, the third insulator means also having a second end both attachable to the second support points on both elements and extending away from the support member generally diametrically opposite from the direction of extension of the second ends of the first and second insulator means.

4,142,079

FLOAT-LEVEL SWITCH WITH LIFTING MECHANISM

Albert J. Bachman, Bristol, Conn., assignor to DeLaval Turbine Inc., Princeton, N.J.

Filed Feb. 9, 1978, Ser. No. 876,314
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 C **22 Claims**



1. In a magnetically operative float-type liquid-level switch, comprising an elongate non-magnetic tubular housing adapted for fixed vertical mounting within a tank for which a particular liquid level is to be monitored, an annular float surrounding and guided for buoyant vertical movement along a portion of said housing, a magnetic-reed electric switch fixedly positioned within said housing at a location correlated with the liquid level to be monitored, externally accessible electric-circuit means including a lead-connection to said switch within said housing, a switch-operating permanent magnet fixed to said float and operative to actuate said switch upon said float achieving said particular level and to release the actuation of said switch upon float descent below said particular level, the improvement which comprises additional permanent-magnet means fixedly carried by said float in axially spaced relation to said switch-operating magnet, a fixed float stop carried by said housing and positioned to prevent float descent beyond a predetermined lower limit of float motion, said lower limit

being below said particular level, a vertically movable magnet within said housing and operative when in elevational proximity to said additional permanent-magnet means to develop a magnetically latching relation thereto, and elongate selectively operable lifting mechanism connected to said movable magnet and extending within and to the upper end of said housing; whereby upon actuating said lifting mechanism to raise said movable magnet into operative relation with said additional permanent-magnet means, said lifting mechanism is operative to also raise said float from its lower-limit position and through an operational check-out range of float displacement to and through said particular level.

4,142,080

FOOT-OPERATED CONTROLLER ASSEMBLY

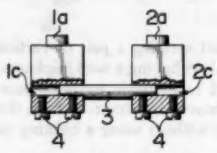
Naoyuki Takahashi, Hino, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,842

Claims priority, application Japan, Jun. 22, 1976, 51/82043[U]

Int. Cl.² H01H *13/16*

U.S. Cl. 200—86.5 **2 Claims**



1. A foot-operated controller assembly for use with a surgical microscope or similar device, comprising a plurality of separate foot-operated controllers, each including an electrical switch mechanism for controlling an operation of said microscope or similar device, said controllers being selectably connected together by one or more elongated spacer members, said controllers each having at least one opening receiving said one or more spacer members, and said controllers each having fasteners securing said spacer members within said openings.

4,142,081

CONTACT SYSTEM FOR HIGH-VOLTAGE POWER CIRCUIT BREAKERS

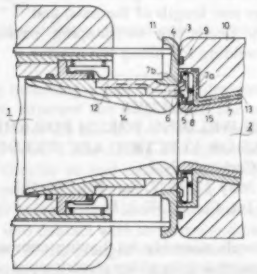
Rainer Bitsch, and Heiner Marin, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,353

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644421

Int. Cl.² H01H *1/50*

U.S. Cl. 200—251 **3 Claims**



1. In a contact system for high voltage power circuit breakers wherein said contact system includes two contacts which are hollow for discharging gases and which have end faces which rest against one another under pressure in the "on" condition of the breaker and are disposed at a distance from one another to form a gap in the "off" condition of the breaker, the improvement comprising:

at least one of said contacts having recesses in its end face, said recesses being distributed around the circumference of said end face; and spring-loaded contact means arranged in said recesses to form with the current path of that contact current loops to reinforce the spring force provided by said contact means.

4,142,082

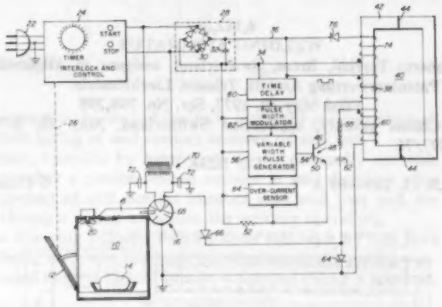
HIGH FREQUENCY POWER SUPPLY MICROWAVE OVEN

Henry M. Israel, Worcester, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 641,794, Dec. 18, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,541

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **10 Claims**



1. In combination:

a microwave oven supplied with microwave energy from a magnetron;

a power supply for said magnetron comprising a transformer having a primary winding supplied with pulses of current from a source at a substantially constant superaudible repetition rate;

a nonsaturating transformer having a magnetic core continuously flux biased in one direction with means for controlling the intensity of said current pulses comprising means for varying the average flux density in said core, said pulses of current being supplied to said primary winding when said magnetron is non-conductive to store energy in said core and cessation of each of said pulses producing a voltage in a secondary winding for supplying current to said magnetron.

4,142,083

APPARATUS AND METHOD FOR TERMINATING ELECTRICAL CONDUCTORS

Gideon A. DuRocher, Mount Clemens, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

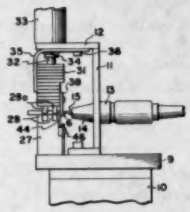
Filed Feb. 24, 1977, Ser. No. 771,441

Int. Cl.² B23K *9/00*

U.S. Cl. 219—58 **12 Claims**

1. Apparatus for forming a bead at a free end of a filament projecting beyond an insulating jacket and composed of material capable of forming a bead when heated to its liquification temperature, said apparatus comprising heating means operable to heat said filament to its liquification temperature; means mounting said heating means at a heating station; means for transporting said filament to said heating station; filament positioning means mounted adjacent said heating station for engaging said jacket and positioning said filament at said heat-

ing station with said free end thereof exposed to said heating means; and means interposed between said positioning means



and said heating means for gripping said filament at said heating station between said jacket and said free end, said gripping means being formed of heat conductive material.

4,142,084

WELDING APPARATUS

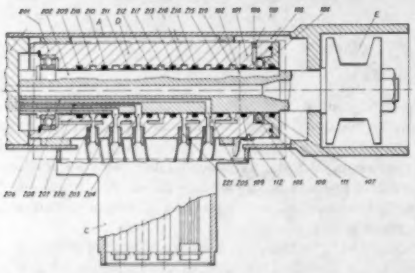
Roberto Torrani, Brent, Switzerland, assignor to Allgemeine Patentverwertung Anstalt, Triesen, Liechtenstein

Filed May 19, 1977, Ser. No. 798,298

Claims priority, application Switzerland, May 25, 1976, 6597/76

Int. Cl.[2] B23K *9/16*

U.S. Cl. 219—60 A **6 Claims**



1. A machine for the automatic butt welding of pipes on tube plates or of abutting pipes of the type having a control unit for programming welding parameters according to cycles suitable to the different welding types and a gun which will be centered on the pipes to be welded, supporting a torch which can effect sequential revolutions, comprising a stationary part and a movable rotatable part with one of said parts being an inner part disposed within the other said part, said other said part forming an outer part, and making surface contact therewith, fluid supply means for supplying cooling and inert gas fluids necessary to the welding operations from the stationary part to the movable part, said fluid supply means comprising a coupling consisting of a first and second plurality of ducts within said parts, a plurality of fluid conveying recesses on the surface of one of said parts communicating said first plurality of ducts with said second plurality of ducts, a plurality of seal elements separating said fluid conveyiing recesses, said fluid conveying recesses providing means for passing the fluids from the ducts of the stationary part to the ducts of the movable part, and a plurality of supplementary recesses alternate to the recesses conveying the fluids, said supplementary recesses having third ducts leading to outside of said outer part so as to drain the fluids possibly escaping from the seal elements and avoiding the mixing of said cooling and inert gas fluids.

4,142,085

METHOD FOR TUBE WELDING

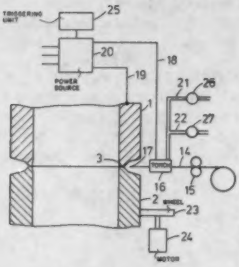
Karl-Erik Knipström; Anders L. Malm, both of Laxå, and Bror H. Andersson, Askersund, all of Sweden, assignors to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Filed Jan. 27, 1977, Ser. No. 762,991

Claims priority, application Sweden, Feb. 6, 1976, 7601302

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—61 **8 Claims**



1. A method of butt welding a pair of vertically disposed, ferrous, tubular members having a wall thickness of more than 12 mm in end-to-end relationship by multi-pass gas-shielded arc welding with a consumable electrode from the outer side of the tubular members without using a backing member, comprising the steps of

(a) preparing the opposed edges of the tubular members by forming a root face on each of the opposed edges the width of which being in the range of 0.5 to 3.0 mm, beveling each of the opposed edges adjacent to the root face to a bevel angle in the range of 40° to 50°, coaxially aligning said tubular members so that the root faces of each of said tubular members are disposed in closely spaced relationship opposite and facing one another and so that said opposed beveled edges define a groove, the gap between the root faces being not larger than 1.5 mm,

(b) performing a root pass by continuously feeding an electrode into the groove with its tip parallel with the root face, the diameter of said electrode being not larger than about 1.0 mm, supplying shielding gas consisting of 0–40% carbon dioxide and the balance argon, energizing an arc between the electrode and the root face, alternately changing the voltage supplied to the arc between a low value and a high value at a frequency of alternation in the range of 0.5 to 2.0 Hz, adjusting the low voltage to produce a droplet transfer of the metal from the electrode into the groove during short-circuit periods, adjusting the high voltage to produce a spray transfer of the metal, adjusting the welding speed and the electrode. feeding speed to deposit metal in the groove in the range of 0.15 to 0.35 grams per mm length of the pass, and

(c) Successively depositing overlapping passes by gas-shielded arc welding for filling the groove.

4,142,086

COMBINATION WELDING TORCH FOR SHIELDED INERT GAS OR ELECTRIC ARC WELDING

James V. Rotilio, Carlstadt, N.J.

Filed May 12, 1977, Ser. No. 796,433

Int. Cl.[2] B23K *9/16, 9/32*

U.S. Cl. 219—75 **9 Claims**

1. A welding torch assembly kit having component parts capable of being assembled for either electric open arc welding using a consumable electrode rod, or inert gas shielded electric arc welding, using a nonconsumable electrode rod, which comprises in combination:

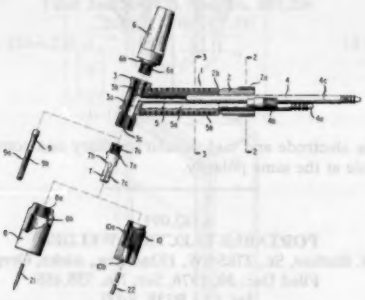
a single welding head and body combination including

means connectable to a source of high current power, to fluid cooling means, and to an inert gas source;

said welding head including electrode retaining means;

a combination hollow collet body connectable to said welding head, said collet body terminating at its external end in a slitted or splined chuck, and having an internal chamber including gas venting means disposed adjacent said chuck and constructed to communicate with said welding head;

shielding means in the form of a first and a second sleeve alternatively connectable to said welding head, each of said sleeves having a longitudinal internal chamber at least partially open at the external end, and constructed and arranged to depend from said welding head to surround said collet body including said chuck in substantially coaxial relation,



said first sleeve, which is constructed for open arc welding using a consumable electrode, consisting essentially of metal, wherein said longitudinal internal chamber is constricted at one end to bear against and constrict the opening of said chuck and to close said gas venting means when said first sleeve is connected in place on said welding head; and

said second sleeve, which is constructed for inert gas shielded arc welding using a nonconsumable electrode, consisting essentially of heat resistant electrical insulating material, wherein said longitudinal internal chamber is constructed and arranged to surround said chuck and said gas venting means is annular spaced-apart relation.

4,142,087

WELDING GUN ADAPTED TO WELD FIXED CONTACTS ON WIRE SPRING RELAYS

Basil D. Crooks, and R. Brian P. Bennett, both of Toronto, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 16, 1977, Ser. No. 797,307
Int. Cl.[2] B23K *9/28, 11/28*
U.S. Cl. 219—90 **3 Claims**

1. Means for welding a contact onto the wire arm of a relay, comprising:

a casing,

said casing mounting a pair of jaws designed to clamp the wire arm adjacent the end where the contact is to be attached, with the end of the wire projecting between the jaws and toward said casing a predetermined amount,

a plunger slidable in said casing, and designed to carry a contact member on the end thereof,

said plunger being located and oriented to move said contact member into contact with said wire end on predetermined movement of the plunger theretowards,

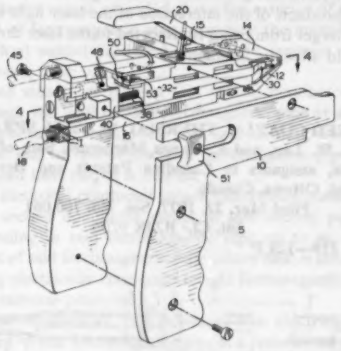
a manually operable member slidable in the same direction as said plunger,

a spring designed to be stressed by movement of said manually operable member in the direction of movement of said plunger towards said wire end,

said spring being designed and arranged to exert pressure on said plunger in accord with the stress thereon,

whereby movement of said manually operable member in said direction stresses said spring sufficiently to move said plunger therewith until said contact member is pressed against said wire end,

and whereby movement of said manually operable member in said direction after said contact member is pressed



against said wire end results in increased pressure through said spring of said contact member on said end,

means, operable by movement of said manually operable member a predetermined amount in said direction after contact of said contact member with said wire end, for closing a circuit to initiate the welding operation,

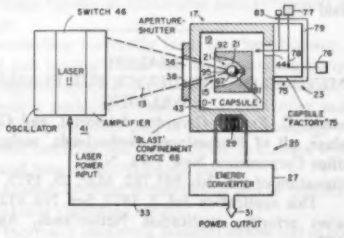
the clamping pressure exerted upon said wire by said jaws being sufficient to retain the wire under the pressure exerted thereon by said contact when said circuit is actuated.

4,142,088

METHOD OF MOUNTING A FUEL PELLET IN A LASER-EXCITED FUSION REACTOR

Robert L. Hirsch, Potomac, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 389,289, Aug. 17, 1973, abandoned.
This application Jan. 27, 1976, Ser. No. 649,948
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **9 Claims**



1. In an optical system of transporting laser light from a laser of the class wherein a laser interacts a laser light beam in a vacuum along an axis from the laser against a target in the vacuum on said axis, the combination with the laser and the target of a shutter means for receiving and transporting the laser light beam from the laser against the target, comprising:

a. laser means for producing a laser light beam in a vacuum along an axis;

b. target means in the vacuum along the axis for producing products from the interaction of the laser light beam and the target;

c. shield means defining an aperture along the axis; and

d. rapidly rotating wheel means defining an opening that rotates in said shield means to provide a continuously unbroken path along the axis when the opening and aperture are in alignment along the axis, said wheel means being rotatable in said shield means selectively to block the path when the aperture and opening are out of alignment for selectively sequentially transmitting the laser light beam along the axis to the target and then blocking the products of the interaction of the laser light beam and the target from being transported to the laser through the shield after the interaction.

4,142,089

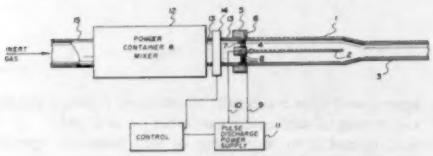
PULSED COAXIAL THERMAL PLASMA SPRAYER

John H. W. Lau, and C. James Margerum, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottowa, Canada

Filed Mar. 22, 1977, Ser. No. 780,061

Int. Cl.[2] B23K *9/06*

U.S. Cl. 219—121 P **5 Claims**



1. Apparatus for applying a coating of material to a substrate comprising:

an elongated electrically conductive tube;

an elongated centre electrode mounted coaxially within a first end of said tube;

means for injecting a mixture of inert gas and powdered material into the first end of said tube; and

means for applying a high energy pulse between the first end of said centre electrode and the first end of of said tube to produce successive current sheets which are initiated between said centre electrode and said conductive tube at the first end of said centre electrode and said tube and which move between said centre electrode and said conductive tube towards the second end of said centre electrode and said tube thereby forming a high temperature and velocity plasma for melting and discharging the powdered material at a high velocity from the second end of said tube.

4,142,090

METHOD OF AND DEVICE FOR PLASMA MIG WELDING

Wilhelmus G. Essers; Gerardus Jelmorini, and Gerrit W. Tichelaar, all of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 561,782, Mar. 25, 1975, abandoned.

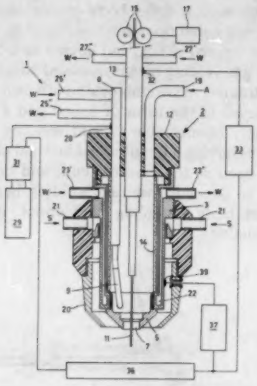
This application Jul. 1, 1977, Ser. No. 812,380

Claims priority, application Netherlands, Apr. 5, 1974, 7404658

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **6 Claims**

1. A method of plasma MIG welding, which comprises establishing a plasma arc between a primary non-consumable electrode and a workpiece to initiate and sustain a plasma flow, feeding a consumable electrode through said plasma flow toward said workpiece, establishing a MIG arc between said consumable electrode and said workpiece, increasing the current intensity in the plasma flow by applying additional current thereto from an annular auxiliary non-consumable electrode surrounding said plasma flow and positioned between said primary non-consumable electrode and said workpiece, and maintaining said primary non-consumable electrode, said consumable electrode and said annular auxiliary non-consumable electrode at the same polarity.



4,142,091

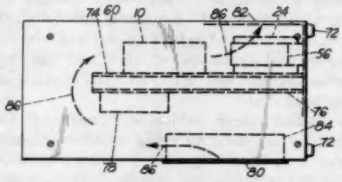
PORTABLE ELECTRIC WELDER

John D. Biethan, Sr., 2785 SW. 192nd Ave., Aloha, Oreg. 97005

Filed Dec. 30, 1976, Ser. No. 755,455

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—130.1 **2 Claims**



1. A portable electric welder comprising

(a) a casing having front and rear end walls, a top wall, a bottom wall, and side walls,

(b) baffle means in said casing extending between said top and bottom walls and leading longitudinally from said rear end wall to a point just short of said front end wall,

(c) said baffle means forming an air circulation path on opposite sides thereof,

(d) air inlet means in said casing disposed on one side of said baffle means adjacent said rear end wall,

(e) air outlet means in said casing disposed on the other side of said baffle means from said air inlet means adjacent said rear end wall,

(f) a welding electrode exteriorly of said casing,

(g) a power supply,

(h) transformer means mounted in said casing on the same side of said baffle means as said air outlet means,

(i) said transformer means having a primary winding connected to said power supply and a secondary winding connected in a circuit with said welding electrode,

(j) rectifier means mounted in said casing on the same side of said baffle means as said air inlet means and being electrically connected in said circuit,

(k) variable control means mounted in said casing adjacent the inner surface of said front end wall and being connected electrically to the primary side of said transformer,

(l) said variable control means including a triac controlled by a relaxation oscillator circuit for varying the power output to said welding electrode,

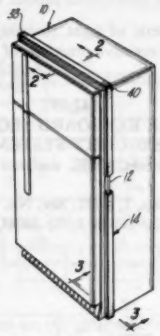
(m) and fan means in said casing forcing air from said air inlet means to said air outlet means whereby said air circulation path leads from said air inlet means along one side of said baffle means to first cool said rectifier means, then around the end of said baffle means at said front end wall to cool said variable control means, and then along the other side of said baffle means to cool said transformer means.

4,142,092

REFRIGERATOR CABINET CASE HEATER INSTALLATION

Donald W. Abrams, Atlanta, Ga., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 5, 1978, Ser. No. 867,206
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—218 **14 Claims**



1. In a refrigerator of the type including a refrigerator cabinet comprised of an outer case having lateral surfaces thereof and at least one access door adapted to be moved into sealing engagement with the door sealing areas on said refrigerator outer case, the combination of a cabinet warming installation, said installation comprising:

a heater element means mounted to the exterior of said cabinet extending about the lateral surfaces of said outer case adjacent said door sealing areas of said cabinet;

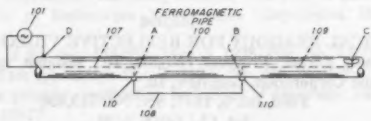
means for energizing said heater element whereby said cabinet is warmed by said exteriorly mounted heater element means.

4,142,093

METHOD AND MEANS FOR SEGMENTALLY REDUCING HEAT OUTPUT IN A HEAT-TRACING PIPE

Paul F. Offermann, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 655,343, Feb. 5, 1976, which is a continuation-in-part of Ser. No. 520,815, Nov. 4, 1974, abandoned. This application Feb. 14, 1978, Ser. No. 877,624
Int. Cl.[2] H05B *3/00, 5/00;* **F16L** *53/00*
U.S. Cl. 219—301 **2 Claims**



2. A system for reducing the heat output of a segment of heat generating ferromagnetic pipe, comprising:

a first electrical conductor means having one end electrically connected to a first terminal of an alternating current power source and having its opposite end extended into a ferromagnetic pipe up to a first point of said ferromagnetic pipe where heat is desired;

a first means for passing said first conductor means through the wall of said ferromagnetic pipe at said first point, said first point being located at the beginning of a segment of ferromagnetic pipe where reduced heat output is desired;

a second electrical conductor means electrically connected to said first conductor means at said first point, said second conductor means extended along the exterior of said segment of ferromagnetic pipe to reduce the magnetic field and heat output produced within said segment of ferromagnetic pipe;

a second means for passing said second conductor means through the wall of said ferromagnetic pipe at a second point of said ferromagnetic pipe, said second point located at the end of said segment of ferromagnetic pipe where reduced heat output is desired;

a third electrical conductor means electrically connected to said second conductor means at said second point and extending in said ferromagnetic pipe up to an extreme point of said ferromagnetic pipe where heat is desired and being electrically connected to said ferromagnetic pipe at said extreme point; and

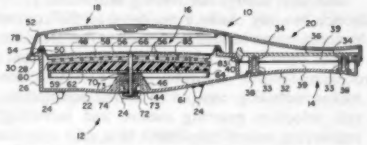
a second terminal of said power source electrically connected to said ferromagnetic pipe at a preselected point on said ferromagnetic pipe spaced apart from said extreme point.

4,142,094

ELECTRICAL APPLIANCE

George Barradas, 15 Riverview Ct., Glenville, Conn. 06830

Filed Jun. 13, 1977, Ser. No. 806,174
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—524 **11 Claims**



1. An electrical frying pan type appliance which comprises;

a base housing having an upstanding peripheral wall with a top edge;

a handle extending outwardly from said base housing;

a cooking pan having a base and an upstanding peripheral wall integrally formed with said base and around its top edge with a peripheral flange supported over said top edge of said peripheral wall of said base housing;

heat resistant electrical insulating means in contact with and below said base of said cooking pan;

electrical heating element means below and in contact with said electrical insulating means;

a body of thermally insulating material below and in contact with said electrical heating element means;

supporting means supporting said body of thermally insulating material in contact with said heating element means, and means fastening said supporting means in position, whereby to maintain said heating element means in contact with said electrical insulating means, thereby insuring direct conduction of heat from said heating element means to said cooking pan;

fastening means for fastening said cooking pan to said base, and,

resilient means associated therewith for permitting relative movement due to thermal expansion.

4,142,095

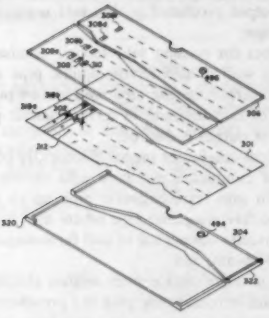
VOTING SYSTEM

Charles M. Cason, Sr., 700 Watts Dr., Huntsville, Ala. 35801, and Charles M. Cason, III, 1207 Toney Dr., Huntsville, Ala. 35802

Continuation-in-part of Ser. No. 742,873, Nov. 18, 1976, Pat. No. 4,066,871. This application Dec. 27, 1977, Ser. No. 864,215

Int. Cl.[2] G07C *13/00*

U.S. Cl. 235—54 F **9 Claims**



1. A system comprising

a portable and hand-held selection entering means comprising:

a first plate,

display means comprising a sheet positioned on said first plate, on which sheet there is a plurality of spaced rows and columns wherein a matrix of discrete light transmissive areas are formed, and

selection means including a second, transparent, plate positioned over said sheet, and including a plurality of hand-operated designators associated with each said area, and comprising means for selectively covering and, alternately, uncovering said areas;

selection reading means responsive to the covered and uncovered areas of said designators for providing discrete output signals indicative of data selection; and

processing means separate from said selection entering means including receptacle means adapted to receive a said selection entering means, and including selection registering means responsive to a said selection entering means and to said output signals from said selection reading means for registering and providing indications of selections made by discrete said designators.

4,142,096

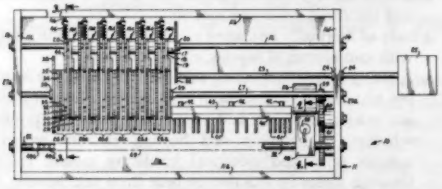
EVENTS ACCUMULATOR DEVICE AND METHOD

Daryl A. Lehnert, 2211 Merriam La., Kansas City, Kans. 66106

Filed Nov. 11, 1977, Ser. No. 850,696

Int. Cl.[2] G06M *1/272*

U.S. Cl. 235—92 EA **4 Claims**



1. A device for recording and accumulating events, said device comprising:

a frame;

a plurality of wheel members each mounted for rotation on said frame, one of said wheel members being adapted to be drivingly rotated in relation to the occurrence of the events that are to be recorded and accumulated;

optically coded means on each of said wheel members for indicating the rotative position of the wheel member with respect to a reference position;

means coupling said wheel members together for differential rotation, with the rotation of each wheel member being related to the rotation of said one member in a predetermined ratio;

a light source operable to emit a beam of light;

a light sensor spaced from said light source in the path of said beam; and

means for scanning said light source along a preselected path, each wheel member being located generally along said path and being optically coded in a manner to intercept the light beam in accordance with the rotative position of the wheel member as said source is scanned along said path,

whereby the pattern of light reaching said sensor corresponds with the rotative positions of said wheel members.

4,142,097

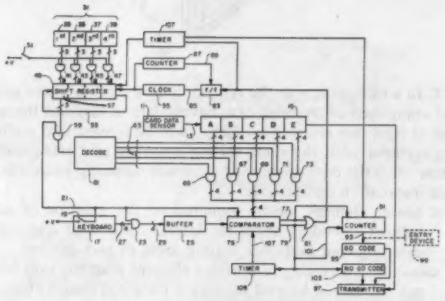
PROGRAMMABLE KEYBOARD SEQUENCING FOR A SECURITY SYSTEM

Bryan D. Ulch, Valencia, Calif., assignor to A-T-O Inc., Willoughby, Ohio

Filed Sep. 1, 1977, Ser. No. 830,004

Int. Cl.[2] G06K *5/00;* **H04Q** *3/02*

U.S. Cl. 235—382 **17 Claims**



1. A circuit used in conjunction with a multi-digit data encoded card for controlling access at a location, comprising:

means sensing and storing said multi-digit data from said encoded card in a predetermined order;

means connected to said sensing and storing means for reordering said multi-digit data to a second order;

a keyboard;

means for comparing data entered on said keyboard with said multi-digit data in said second order to control said access; and

switch means for changing said second order.

4,142,098

OPTICAL READOUT FOR REFLECTIVE VIDEO DISCS

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 5, 1977, Ser. No. 813,036

Int. Cl.[2] G01V *1/20*

U.S. Cl. 250—201 **1 Claim**

1. An optical system for detecting a timevarying information signal which has been converted to a modulated carrier and spatially recorded upon a record disc, which recording effectively constitutes a sequence of light scattering or light deflecting elements arranged along an elongated spiral track, said

sequence comprising a spatial pattern representative of the modulated carrier, said optical detection system comprising:

means for supporting said record disc in a reading plane;

means for developing an optical read beam;

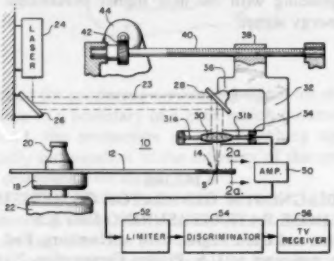
means including an objective lens disposed in the path of said beam and on a predetermined side of said disc for focusing said read beam into a reading spot on said record track,

said reading spot having a dimension relative to said spatial pattern of said track sufficient to resolve the highest spatial frequency of said recorded carrier;

drive means for displacing said record, relative to said reading spot and at a predetermined velocity, to effect interrogation of said track by said reading spot so as to cause to be developed a reflected time-varying diffraction pattern of said spot that corresponds to said recorded spatial pattern,

said diffraction pattern comprising a distribution of scattered or deflected light oriented predominantly in a predetermined direction relative to said track;

and light responsive means, comprising a quadrant of photo-



detectors, disposed on the same side of disc as said objective lens and in the far field of said reading spot and outside the cone of focused light established by said objective lens in forming said reading spot,

said quadrant including a first pair of photodetectors disposed on opposite sides of said objective lens and a second pair of photodetectors also disposed on opposite sides of said objective lens and orthogonally disposed to and interposed between said first pair,

said first pair straddling said track to develop electrical signals in response to intercepted radially deflected light rays, said second pair being aligned parallel to said track to develop electrical signals in response to intercepted tangentially deflected light rays;

said system further including a first amplifier responsive to said electrical signals developed by said first pair of photodetectors for deriving a tracking signal;

and also including a second amplifier responsive to said electrical signals developed by said second pair of photodetectors for deriving a replica of said modulated carrier signals.

4,142,099

PROCESS AND APPARATUS FOR CONTROLLING METAL THICKNESS, AND DEPOSITION AND DEGRADATION RATES

Günther Herrmann, Nuernberg-Ebensee, Fed. Rep. of Germany, assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 555,030, Mar. 3, 1975, Pat. No. 4,073,964. This application Dec. 8, 1976, Ser. No. 748,420

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1974, 2410927

Int. Cl.[2] G21K *7/00*; G01N *23/00*

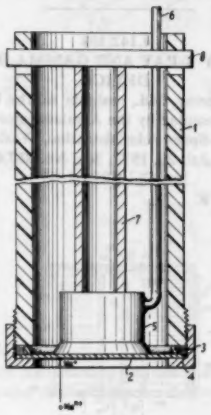
U.S. Cl. 250—308 **7 Claims**

1. An immersible sensor comprising

(i) a casing made of a material that is highly resistant to acid and/or alkali in the form of a liquidtight envelope;

(ii) a test sample of suitable size which is mounted in an aperture in said casing in such a way that a part of said test sample faces outwards and is adapted to contact with a bath liquid when immersed therein and a second part faces the interior of said casing;

(iii) a measuring head mounted in said casing for acting both as a source of radiation and as a receiver for the radiation



energy scattered by the test sample and a layer of metal thereon; and

(iv) a liquid-tight signal lead within said casing for carrying a signal supplied by said measuring head to a signal display and recording apparatus located outside a bath liquid in which said sensor is immersed.

4,142,100

PROCESS AND APPARATUS FOR RECORDING AND OPTICALLY REPRODUCING X-RAY IMAGES

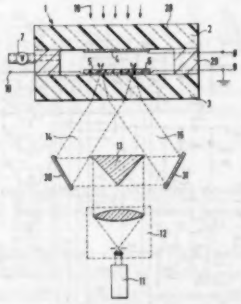
Roland Moraw, Wiesbaden-Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,368

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647324

Int. Cl.[2] G03G *15/00*

U.S. Cl. 250—315 A **36 Claims**



1. A process for recording X-ray images on recording material in an ionization chamber which comprises the steps of:

(a) providing an ionization chamber which is filled with a gas which may be ionized by X-rays and which further contains two electrodes and a recording material;

(b) applying a high voltage to said electrodes;

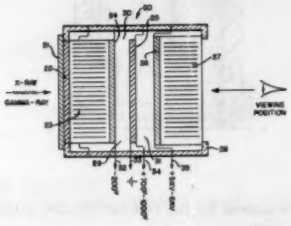
(c) directing X-ray radiation at said chamber such that said ionizable gas is ionized;
(d) producing periodic differences in the optical path lengths in the layer of said recording material while said chamber is being subjected to X-ray radiation; and
(e) heating said recording material to form a deformation image on the surface of said recording material.

4,142,101

LOW INTENSITY X-RAY AND GAMMA-RAY IMAGING DEVICE

Lo I Yin, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 20, 1977, Ser. No. 817,415
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—363 R **37 Claims**



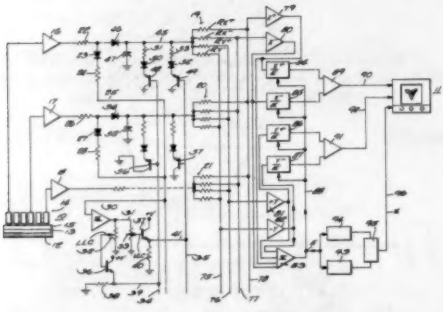
1. Apparatus for converting radiation to visible light, comprising:
means for converting incoming invisible radiation to visible light;
means for visible light intensification, which means includes a microchannel plate amplifier; and
means for light coupling said means for converting incoming radiation and said means for visible light intensification.

4,142,102

ENERGY INDEPENDENT UNIFORMITY IMPROVEMENT FOR GAMMA CAMERA SYSTEMS

Kai Lange, Vedbaek, Denmark, assignor to General Electric Company, Milwaukee, Wis.

Filed Jun. 20, 1977, Ser. No. 807,864
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—369 **9 Claims**



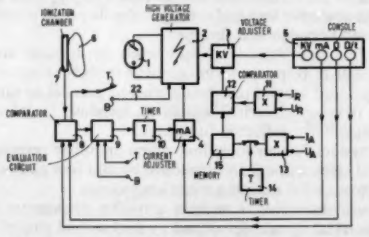
1. In a radiation imaging system:
a plurality of detectors for detecting radiant energy emitted by a subject, each of said detectors producing an electric pulse substantially simultaneously in response to each detected radiation event,
a plurality of preamplifier means for amplifying simultaneously the electric pulses from the respective detector means,
means for summing said electric pulses from said preamplifier means and for producing a signal representing the total energy of said pulses during each radiation event,
means responding to said total energy signal by producing bias signals, respectively, corresponding respectively with different predetermined precentages of the said total energy signal so the absolute values of said bias signals vary in correspondence with total energy, and
output circuit means for the electric pulses from said preamplifier means and including control means controlled respectively by said bias signals to change the gain of said preamplifier means coincident with occurrence of signals from said preamplifier means which have greater magnitudes than a bias signal corresponding with the lower of said percentages of the peak of said total energy signal and to change the gain again coincident with occurrence of signals which have greater magnitudes than a bias signal corresponding with the next higher percentage of said total energy signal.

4,142,103

X-RAY DIAGNOSTIC GENERATOR COMPRISING A DOSE RATE MEASURING DEVICE

Heinz Mester, and Gerd Vogler, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1977, Ser. No. 852,696
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653252
Int. Cl.[2] H05G *1/46*
U.S. Cl. 250—409 **8 Claims**



1. An X-ray diagnostic generator, comprising a dose rate measuring device and adjusting means for X-ray tube current and X-ray tube voltage, at least one of said adjusting means functioning so that the difference between the measured actual value and a presettable reference value of the dose rate decreases comprising, as an improvement a multiplier circuit which forms the product of the tube current and the tube voltage during an exposure, said product being applied to first comparison means which compare the product with a presettable tube power reference value and which act on at least one of said adjusting means to control the tube power, the tube voltage and the tube current being changed in an opposite sense during control of the tube power.

4,142,104

Patent Not Issued For This Number

4,142,105

METHOD FOR PRODUCING A SWITCHING SIGNAL ON THE PASSAGE OF A CONTRAST JUMP

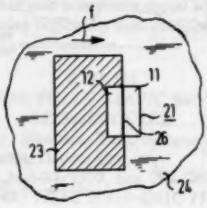
Jürgen Erdmann, Waldkirch-Buchholz, Fed. Rep. of Germany, assignor to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Fed. Rep. of Germany

Filed Jun. 16, 1977, Ser. No. 807,712

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636906

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—548 19 Claims



1. Method for producing a switching signal for determining the position of a boundary of a zone which contrasts with its background, the production of said switching signal being substantially independent of the intensity of the contrast, the method comprising the steps of:

(a) producing relative movement between light from the contrasting zone and a photoelectric detector device comprising first and second photoelectric receivers disposed in series in the direction of relative movement;

(b) generating first and second light intensity responsive signals with the receivers;

(c) forming the instantaneous difference of the light responsive signals derived from the photoelectric receivers;

(d) determining a value corresponding the maximum value of the difference;

(e) deriving a fractional value equal to a fraction of the maximum value;

(f) comparing the instantaneous difference with the fractional value corresponding to the boundary of the zone passing the second detector, and

(g) generating the switching signal when the instantaneous difference equals the fractional value.

4,142,106

TRANSFER PRINTING RIBBON ERROR DETECTION SYSTEM

Ronald L. Toth, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

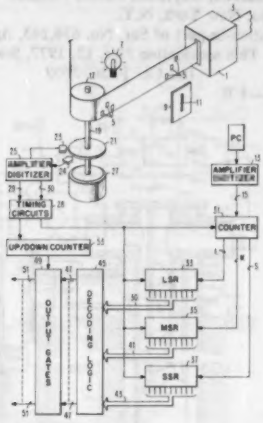
Filed Dec. 29, 1977, Ser. No. 865,634

Int. Cl. G01N *21/30*

U.S. Cl. 250—559 10 Claims

1. Error detecting apparatus for detecting errors in printing operations employing transfer printing ribbons, comprising, in combination,

scanning means for scanning the ribbon following the printing operation and providing scanning signals indicative of the voids left in the ribbon by the printing operation, and



analyzing means connected to said scanning means for determining the value of the character denoted by the scanned voids.

4,142,107

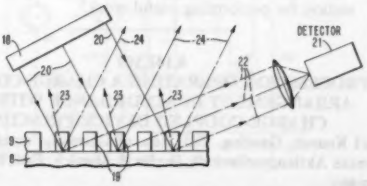
RESIST DEVELOPMENT CONTROL SYSTEM

Michael Hatzakis, Ossining; Constantino Lapadula, Mahopac, and Burn J. Lin, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,758

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—571 16 Claims



1. A manufacturing system for controlling development of a resist pattern on a film of resist deposited upon a substrate including

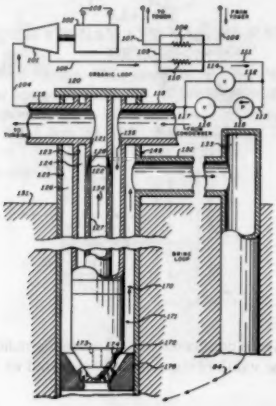
a film of a developing resist exposed to a pattern in a first area of its surface and exposed in a monitoring area of its surface to a diffraction grating pattern with a different degree of exposure, and

means for optically monitoring the monitoring area during development of said resist to determine when the resist has been substantially removed from the monitoring area to provide a signal indicating a shift in light intensity reaching a predetermined location for the purpose of providing an indication of the endpoint of development of said pattern upon said first portion.

4,142,108
GEOTHERMAL ENERGY CONVERSION SYSTEM

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 674,243, Apr. 6, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,270
Int. Cl.[2] F03G 7/00
U.S. Cl. 290—1 R 32 Claims



1. The method of transferring thermal energy from an interior hot region within the earth for utilization adjacent the surface of said earth including the steps of:

conveying a first liquid initially in a relatively cool state from a first station adjacent said surface of said earth to a second station within said earth,

employing said thermal energy for converting said first liquid into supercritical state during transit from said first station to said second station,

employing said first liquid in supercritical state for driving pump means at said second station,

employing said pump means for pumping a second liquid from said interior hot region to said first station at a pressure retaining said second liquid always in liquid state,

conveying said first fluid after driving said pump means in thermally insulated relation with respect to said second liquid to said first station, and

abstracting thermal energy from said first fluid at said first station for performing useful work.

4,142,109
PROCESS FOR OPERATING A CHARGE-COUPLED ARRANGEMENT IN ACCORDANCE WITH THE CHARGE-COUPLED DEVICE PRINCIPLE

Karl Knauer, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

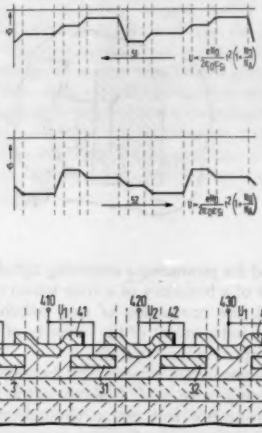
Filed Dec. 17, 1975, Ser. No. 641,818
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1975, 2500909
Int. Cl.[2] H01L 29/66
U.S. Cl. 307—221 D 2 Claims

1. In a process for operating a charge-coupled arrangement for two-phase operation in accordance with the charge-coupled principle, the charge-coupled arrangement comprising a substrate of doped silicon semiconductor material carrying an insulating layer, a plurality of first electrodes spaced apart in a first level in the insulating layer and insulated from the substrate, a plurality of second electrodes spaced apart and carried by the insulating layer in a second level over the interspaces of and electrically insulated from the first electrodes, each of the second electrodes electrically connected to an adjacent first electrode, and a zone in the substrate beneath the electrodes and beneath the insulating layer which is doped opposite to the doping of the substrate, for operating in one of two determinate directions the improvement comprising the step of:

applying a bias voltage to all of the first electrodes and to all of the second electrodes such that the potential between the electrodes and the semiconductor substrate is greater than

$$(eN_D/2\,\epsilon_o\epsilon_{si})\,d^2(1 + N_D/N_A)$$

for operation in one direction and less than



$$(eN_D/2\,\epsilon_o\epsilon_{si})\,d^2(1 + N_D/N_A)$$

for operation in the opposite direction, where

e is an electron charge,

N_D is the donor concentration in the doped zone,

N_A is the acceptor concentration in the substrate,

d is the thickness of the doped zone,

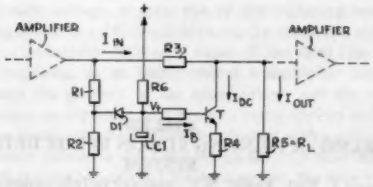
ϵ_o is the dielectric constant in a vacuum, and

ϵ_{si} is the dielectric constant of silicon.

4,142,110
CIRCUIT TO ELIMINATE DC BIAS

Rudolf Weber, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Fa. Weber Lichtsteuergeräte KG., Darmstadt, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,437
Int. Cl.[2] H03K 5/08
U.S. Cl. 307—237 5 Claims



1. A coupling circuit for removing a DC component from a composite signal having a predetermined frequency range comprising, in combination:

a transistor having a substantially constant DC output threshold for a variable drive signal at a predetermined operating region,

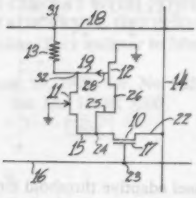
biasing means connected to said transistor and operable for setting a controllable operating region defining said constant DC output threshold, said operating region corresponding substantially to said DC component of the composite signal, and being at least partially controllable by signals within said predetermined frequency range, and

means for applying said composite signal as the driving signal to said transistor to remove from said composite signal said DC component lying below said threshold, and to pass the signal component exceeding said threshold, said biasing means having a relatively high time constant with respect to the highest frequency within the frequency range of said composite signal to minimize control of said operating region by said composite signal.

4,142,111
ONE-TRANSISTOR FULLY STATIC SEMICONDUCTOR MEMORY CELL

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 27, 1977, Ser. No. 762,916
Int. Cl.[2] H03K 3/353; G11C 11/34
U.S. Cl. 365—178 19 Claims



1. A semiconductor integrated circuit comprising an MOS transistor having a source-drain path and a gate, the source-drain path of the MOS transistor being connected between a first node and a source of logic voltages, the gate of the MOS transistor being connected to a different source of logic voltages, an implanted field effect resistor having a current path, the current path of the field effect resistor being connected between the first node and a second node, impedance means connecting the second node to a voltage supply, a vertically oriented field effect transistor having a source-drain path and a gate, the gate of the field effect transistor being connected to the second node, means connecting the first node through the source-drain path of the field effect transistor to a reference potential, the field effect resistor and the field effect transistor both exhibiting a low impedance state when the voltage on the first and second nodes is relatively low and exhibiting a high impedance state when the voltage on the first and second nodes is relatively high.

4,142,112
SINGLE ACTIVE ELEMENT CONTROLLED-INVERSION SEMICONDUCTOR STORAGE CELL DEVICES AND STORAGE MATRICES EMPLOYING SAME

Harry Kroger, Sudbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

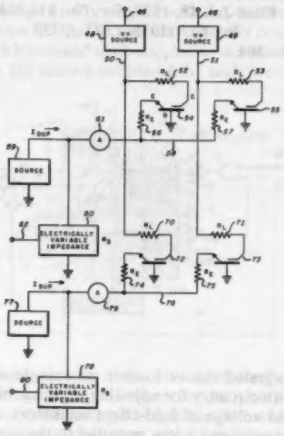
Filed May 6, 1977, Ser. No. 794,430
Int. Cl.[2] G11C 11/40; H01L 49/00; H03K 3/57
U.S. Cl. 307—238 8 Claims

1. A semiconductor memory device including a regular array of cells, each said cell comprising controlled-inversion semiconductor switching means having collector, base, and emitter electrode means and each characterized by first and second discrete impedance states between said collector and emitter electrode means, said base electrode means being coupled to ground, said semiconductor memory device further including:

voltage source means,

load resistor means for coupling said voltage source means at least to said collector electrode means,

current source means,



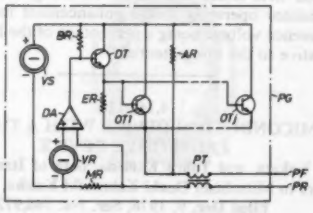
emitter resistor means for coupling said current source means at least to said emitter electrode means, and

selectively variable impedance means coupled in shunt relation with said current source means.

4,142,113
CURRENT PULSE CIRCUIT FOR FERRITE CORE MEMORIES

Nils E. B. Lundberg, Enskede, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 16, 1977, Ser. No. 778,225
Claims priority, application Sweden, Apr. 5, 1976, 7603992
Int. Cl.[2] H03K 1/00
U.S. Cl. 307—270 3 Claims



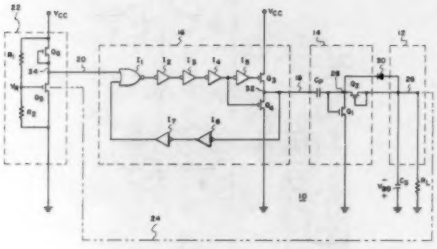
1. Current pulse generating apparatus comprising: a differential transformer having first and second windings, one end of each winding being adapted to be connected to a load; a current source having first and second terminals; a plurality of transistor means, each of said transistor means having collector-, base- and emitter-terminals; means for connecting all of said collector terminals in parallel to one of the terminals of said current source; means for connecting all of said emitter terminals to the other end of one of said windings; driver circuit means having an output connected to all of said base terminals in parallel and a control input; control means responsive to current flow through one of said windings, and connected to the other end of the other winding for controlling the operation of said driver means; and means for connecting the other terminal of said current source to said other end of said other winding.

4,142,114

INTEGRATED CIRCUIT WITH THRESHOLD REGULATION

Robert S. Green, Richardson, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Jul. 18, 1977, Ser. No. 816,364
Int. Cl.[2] H03K *1/02, 3/353*
U.S. Cl. 307—304 **5 Claims**



1. An integrated circuit formed on a single semiconductor substrate with circuitry for adjusting substrate bias to regulate the threshold voltage of field-effect transistors, comprising:

means for receiving a low potential to the circuit,

means for receiving a high potential to the circuit,

an oscillator having an output that rapidly varies between a voltage near the high potential and a voltage near the low potential,

charge pump means connected between the oscillator output and the substrate for incrementally charging the substrate during each cycle of the oscillator wherein a field-effect transistor is connected between the substrate and the charge pump means to provide a path parallel to an inherent injection path created by the junction of the substrate and the charge pump means,

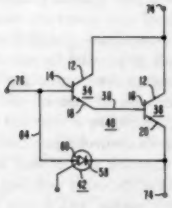
controlling means comprising detector means responsive to the substrate potential for enabling the oscillator to selectively pump the substrate whenever the threshold voltage of a designated field-effect transistor deviates by a predetermined amount from a reference voltage wherein the detector means comprises a voltage divider circuit for providing the reference voltage to the gate of the designated field-effect transistor, the designated field-effect transistor operating in the enhancement mode, and the reference voltage being a percentage of the high potential relative to the low potential.

4,142,115

SEMICONDUCTOR DEVICE WITH A THERMAL PROTECTIVE DEVICE

Josuke Nakata, and Tohru Kameda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 748,972
Claims priority, application Japan, Dec. 12, 1975, 50-148854
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—315 **9 Claims**



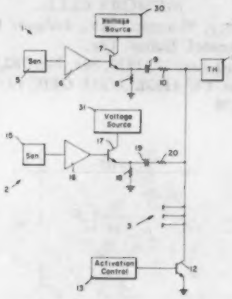
1. A Darlington circuit comprising a first transistor, a second transistor and a thermally sensitive four region semiconductor switching device, said thermally sensitive four region switching device being connected electrically in a series circuit relationship between base and emitter regions of the first and second transistors respectively and said thermally sensitive four region switching device being in physical and thermal contact with a predetermined portion of one of said transistors.

4,142,116

ADAPTIVE THRESHOLD CIRCUIT

Arthur H. Hardy, Jr., and Mark E. Preiser, both of Santa Barbara, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 18, 1977, Ser. No. 798,211
Int. Cl.[2] H03K *5/18*
U.S. Cl. 307—350 **12 Claims**



1. A multi-channel adaptive threshold circuit to extract and combine information from a plurality of noisy input signals each generated by a signal reception means said adaptive threshold circuit comprising:

a plurality of detection channels for generating a detected signal at the output thereof, wherein each channel output is coupled in parallel relationship, each of the channels including:

unidirectional conducting means having an input coupled to said signal reception means to receive said input signal, and

adaptive means coupled to the output of said unidirectional coupling means wherein the output of said adaptive means is the detection channel output;

threshold detection means coupled to the detection channel outputs for applying said detected signal thereto; and

threshold enabling means coupled to the detection channel outputs and the threshold detection means for enabling said adaptive threshold circuit, wherein said threshold enabling means comprises a switch coupled between ground and said threshold detection means, and switch control means oriented to open and close said switch.

4,142,117

VOLTAGE SENSITIVE SUPERCHARGER FOR A SAMPLE AND HOLD INTEGRATED CIRCUIT

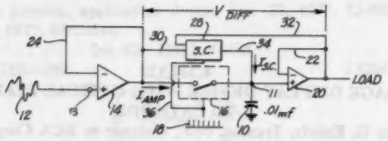
James J. S. Chang, San Jose, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Apr. 11, 1977, Ser. No. 786,196
Int. Cl.[2] G11C *27/02*
U.S. Cl. 307—353 **20 Claims**

1. An integrated circuit for sampling an input signal and charging a sample holding means to within a predetermined range indicative of each successive sample, said circuit comprising:

input terminal means for receiving an input signal and output terminal means for connection with a sampling holding means,

circuit means connected between said input and output terminals for providing a first charging signal to said output terminal, the magnitude and polarity of said charging signal being determined by the input signal sample, and



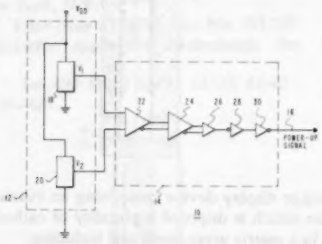
a supercharging means discrete from said circuit means, said supercharging means having means to compare the signal levels at said input and output terminals, and means to provide a supplemental charging signal to add to the first charging signal at said output terminal when the differential between said compared signals exceeds a predetermined threshold level.

4,142,118

INTEGRATED CIRCUIT WITH POWER SUPPLY VOLTAGE LEVEL DETECTION

Elmer H. Guritz, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Aug. 18, 1977, Ser. No. 825,602
Int. Cl.² H03K 3/00
U.S. Cl. 307—358 **10 Claims**



1. An integrated circuit device powered by an external power supply comprising:

means responsive to the external power supply for producing a first reference voltage,

means responsive to the external power supply for producing a second reference voltage, the first reference voltage exceeding the second reference voltage at a time when the voltage provided by the external power supply is less than a predetermined voltage, the second reference voltage exceeding the first reference voltage at a time when the voltage provided by the external power supply is greater than the predetermined voltage, and

means for generating a signal when the second reference voltage exceeds the first reference voltage.

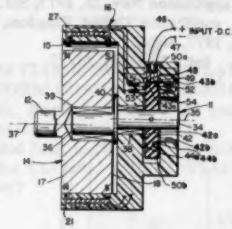
4,142,119

ROTARY ELECTRIC DEVICE

Jesse M. Madey, Hyattsville, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 21, 1977, Ser. No. 779,871
Int. Cl.² H02K 37/00
U.S. Cl. 310—46 **17 Claims**

1. A rotary electric device for establishing high speed ratios between a pair of rotating shafts comprising a stator having a cylindrical bore member with a longitudinal axis, a rotor member positioned to roll in the bore about the axis so that there is contact and no magnetic air gap between a relatively small portion of the rotor and the periphery of the bore, a high speed shaft, the high speed shaft having a first section rotatably coupled in the stator axially aligned with the axis and a second section offset from the first section and rotatably coupled in the rotor member, a low speed shaft coupled to the rotor in coaxial alignment with the second section of the high speed shaft for



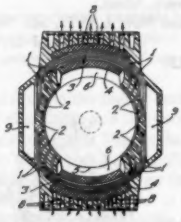
providing eccentric turning of the low speed shaft, means for applying a rotating magnetic field to the periphery of one of the members, said field having a longitudinally extending magnetic field component, the other of said members including longitudinally spaced magnetic pole faces that are alternately attracted to different portions of the periphery of the one member as the magnetic field rotates about the periphery of the one member.

4,142,120

COMMUTATOR MOTOR

Stig L. Hallerback, Vastra Frolunda, Sweden, assignor to AB Electrolux, Stockholm, Sweden and SKF Industrial Trading and Development Company, Nieuwegein, Netherlands

Filed Dec. 6, 1976, Ser. No. 747,967
Claims priority, application Sweden, Dec. 17, 1975, 7514241
Int. Cl.² H02K 9/00
U.S. Cl. 310—59 **6 Claims**



1. A commutator motor comprising a housing, a stator consisting of a plurality of laminations embedded in the housing and defining at least a pair of circumferentially spaced yoke portions and pole portions intermediate the yoke portions, a rotor rotatably supported in the stator cavity, the yoke portions being of a predetermined configuration defining first axial channels having inlet and outlet openings to facilitate flow of cooling medium through the channels in one direction, a commutator chamber at one axial end of the rotor separated by a circumferentially extending wall, said circumferentially extending wall extending radially inwardly close to the rotor and spaced therefrom to define a small annular gap, the arrangement providing a pumping action of cooling medium through the commutator chamber, means defining second channels outboard of the stator and pole portions including a wall portion separating said second channels and said stator cavity communicating with said chamber at one end and fan means to circulate a cooling medium through said second channels and

chamber in an axial direction opposite the direction of flow of said cooling medium through said first channels.

4,142,121

ELECTRICAL IGNITERS

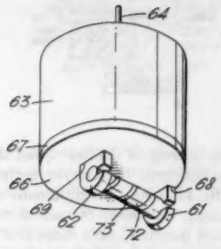
Frederick C. Carpenter, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Continuation-in-part of Ser. No. 718,704, Aug. 20, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 855,108

Claims priority, application United Kingdom, Sep. 8, 1975, 36919/75; Sep. 29, 1977, 40542/77

Int. Cl.[2] H01T *13/52*

U.S. Cl. 313—131 A **13 Claims**



1. An electrical igniter comprising first and second electrodes, said first and second electrodes being spaced from one another, a rod-shape element, means mounting said rod-shape element to extend between said first and second electrodes, at least a part of the surface along the length of said element being a semiconductive surface, said semiconductive surface providing an electrical discharge path between said electrodes along the length of said element.

4,142,122

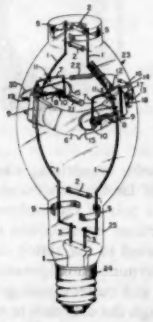
DISCHARGE LAMP HAVING ARCHED ARC TUBE

Francis R. Koza, Salem, N.H., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 2, 1977, Ser. No. 847,711

Int. Cl.[2] H01J *61/33*

U.S. Cl. 313—220 **2 Claims**



1. In a metal halide arc discharge lamp of the type comprising an arched arc tube disposed within an elongated outer envelope having a cylindrical neck portion, the length of the arc tube being greater than the diameter of the neck portion, the improvement which comprises the arched arc tube being transverse to the axis of the outer envelope, the arc tube being rotatably supported on an elongated frame, a latch on said frame latching the arc tube in said transverse position, and torsion springs on said frame which act to restore the arc tube to said transverse position when the arc tube is rotated away from said transverse position.

4,142,123

IMAGE DISPLAY DEVICE WITH OPTICAL FEEDBACK TO CATHODE

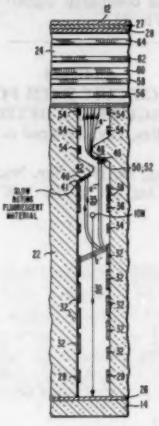
John G. Endriz, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,477

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.[2] H01J *31/48, 43/00*

U.S. Cl. 313—400 **11 Claims**



1. An image display device comprising an evacuated envelope within which is disposed a plurality of cathodoluminescent cells in a matrix array, each cell including:

a. a source of electrons comprising:

1. a cathode electrode having means for emitting electrons in response to impinging electromagnetic radiation;

2. means, including said cathode electrode, for establishing an electrical discharge, said discharge means further comprising:

i. an anode electrode having means for producing electromagnetic radiation in response to bombardment by electrons;

ii. an open channel between said anode electrode and said cathode electrode whereby a fraction of the electromagnetic radiation produced by said anode electrode is clear to feed back to and impinge upon said cathode electrode; and

iii. means for sustaining a flow of electrons from said cathode electrode to said anode electrode;

b. electron beam formation means;

c. means for modulating a flow of electrons from said electron beam formation means;

d. means for accelerating the modulated flow of electrons;

e. a cathodoluminescent screen excitable by the accelerated and modulated flow of electrons, said screen being separated from said anode electrode; and

f. additional means for storing a portion of the energy of said electrical discharge and then spontaneously emitting said stored energy to establish a subsequent electrical discharge.

4,142,124

PIEZOELECTRIC CRYSTALLINE ZnO WITH 0.01 TO 20.0 ATOMIC % Mn

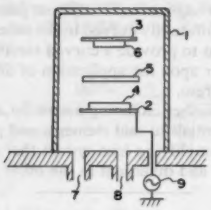
Toshio Ogawa; Tasuku Mashio, both of Nagaokakyo, and Hiroshi Nishiyama, Mukou, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jan. 25, 1978, Ser. No. 872,342

Claims priority, application Japan, Jan. 25, 1977, 52-6909; Mar. 26, 1977, 52-33510

Int. Cl.[2] H01L *41/18*

U.S. Cl. 310—360 2 Claims



1. A piezoelectric crystalline film consisting essentially of a crystalline zinc oxide film with a c-axis perpendicular to the substrate surface, characterized in that said crystalline zinc oxide film contains 0.01 to 20.0 atomic percent of manganese.

4,142,125

FLUORESCENT DISCHARGE LAMP WITH INNER HOLLOW TUBE OFFSET FROM ENVELOPE AXIS

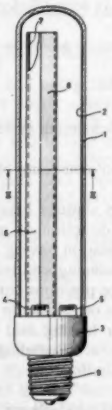
Petrus C. Lauwerijssen, and Antonius J. Van Meer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,719

Claims priority, application Netherlands, Jun. 17, 1976, 7606547

Int. Cl.[2] H01J *61/10, 61/30, 61/42*

U.S. Cl. 313—485 7 Claims



1. A low pressure gas discharge lamp which comprises an elongated sealed, light transparent lamp envelope having first and second ends and a geometric axis, an ionizable medium in said lamp envelope, a first electrode in said lamp envelope at said one end thereof, a discharge space within said lamp envelope, an elongated hollow inner tube disposed within said lamp envelope with one end thereof disposed about said first electrode and engaging said first end of said lamp envelope, the other end of said inner tube being open to the interior of said lamp envelope, a second electrode disposed in said inner tube at said first end thereof, and a luminescent coating disposed on at least a portion of the inner wall of said lamp envelope, said inner tube having a geometric axis, said inner tube being disposed in said lamp envelope with said axis of said envelope and said axis of said tube being generally parallel, said tube being eccentrically disposed in said lamp envelope and further including a luminescent coating on the outer wall of said inner tube extending over not more than 80% of the circumferential extent of said inner tube, the portion of said inner tube which is provided with a luminescent coating facing away from the portion of said inner tube which is nearest to the wall of the lamp envelope, said lamp having not more than one inner tube in said lamp envelope.

4,142,126

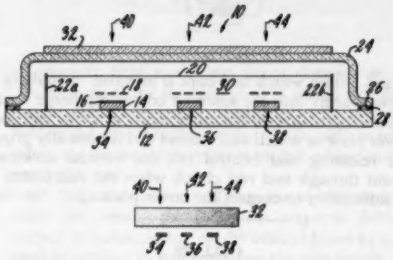
VACUUM FLUORESCENT DISPLAY HAVING UNIFORM CHARACTER BRIGHTNESS

Richard DuBois, North Caldwell, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Mar. 6, 1978, Ser. No. 883,692

Int. Cl.[2] H01J *5/16, 63/02, 63/06*

U.S. Cl. 313—497 24 Claims



12. A vacuum fluorescent display device comprising:

(a) an evacuated enclosure;

(b) a plurality of phosphor-coated anode segments forming a plurality of characters within said enclosure;

(c) a transparent wall in said enclosure for viewing said characters along lines of sight;

(d) at least one cathode disposed over said plurality of segments;

(e) said cathode being electrically heatable to provide electrons for the excitement of the phosphor coating on selected ones of said anode segments to form selected illuminated characters;

(f) at least one optical filter in the line of said sight between at least one of said characters and the viewer;

(g) the optical transmission of said filter in the line of sight to at least one of saic characters being different from the optical transmission to at least one other thereof whereby the apparent brightness of at least two of said characters relative to each other is different than the relative brightness of the glowing phosphor on said at least two characters.

4,142,127

CONTROL MEANS FOR CONTROLLING THE POSITION OF AN ELECTRODE IN A CARBON ARC LAMP

Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

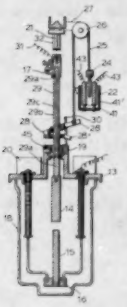
Filed Aug. 18, 1977, Ser. No. 825,856

Int. Cl.[2] H05B *31/18*

U.S. Cl. 314—105 6 Claims

1. In a carbon arc lamp having a transparent enclosure with a lower electrode therein and a cover plate over the enclosure through which an electrode control rod held in a holder slidably extends for holding an upper electrode in the enclosure, and an electric circuit for supplying arc discharge current across said electrodes, an improved control means for automatically adjusting the vertical position of said electrode control

rod for automatically starting the arc if it has been extinguished and for compensating for consumption of the upper electrode during normal use, said control means comprising: a pulley on said lamp above the level of said control rod, a line over said pulley and hanging downwardly therefrom, a magnetic core on one end of said line, a solenoid coil connected in the electric



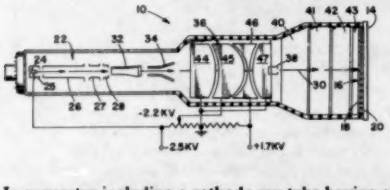
circuit and within which said core is movable for pulling the core downwardly into the solenoid coil as discharge current increases, a rod clutch on the other end of said line and above said cover plate in which said control rod is normally gripped and for releasing said control rod for vertical downward movement through said rod clutch when the rod clutch descends sufficiently to contact the cover plate.

4,142,128

BOX-SHAPED SCAN EXPANSION LENS FOR CATHODE RAY TUBE

Conrad J. Odenthal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 18, 1977, Ser. No. 788,474
Int. Cl.[2] H01J *29/56, 29/46*
U.S. Cl. 315—15 **13 Claims**



1. In apparatus including a cathode ray tube having a target screen, an electron gun for producing an electron beam directed toward said screen, deflection means disposed along the path of said beam for deflecting the beam in two orthogonal directions, and an electron lens system located along said path intermediate said deflection means and screen for amplifying the beam deflections, the improvement wherein

said system comprises first, second, and third axially aligned tubular elements of rectangular crosssectional configuration, disposed to accomodate the passage of the beam therethrough and spaced apart a sufficient distance to isolate them electrically from one another, each of said elements including beam entrance and exit ends, one pair of opposite sides parallel to one of said orthogonal directions, and another pair of opposite sides parallel to the other of said directions,

a first pair of flat plates located intermediate said first and second elements, each plate of the pair being disposed in edge adjacent, parallel relation with the corresponding sides of each element's said one pair of opposite sides, and spaced apart therefrom a sufficient distance to isolate them electrically from one another,

second and third pairs of flat plates located intermediate said first and second elements, each plate of the second pair being disposed in edge adjacent, parallel relation with the corresponding sides of the first element's other pair of opposite sides, and spaced apart therefrom a sufficient distance to isolate them electrically from each other, each plate of the third pair being disposed in edge adjacent, parallel relation with the corresponding sides of the second element's other pair of opposite sides, and spaced apart therefrom, and from the corresponding plates of said second pair, a sufficient distance to isolate them electrically from one another,

the opposed end edges of each adjacent pair of elements and plates being differently curved in the other of said orthogonal directions to provide a curved electron lens between each such pair upon the application of different electrical potentials thereto,

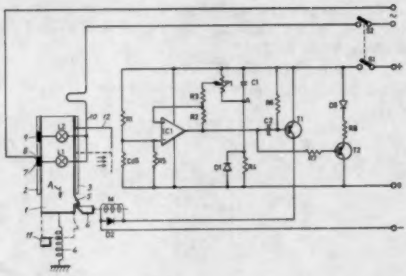
said apparatus further including means for applying suitable different potentials to said elements and plates to provide a deflection amplifying lens system that is convergent in one direction and divergent in the other.

4,142,129

LAMP CHANGING SYSTEM FOR PROJECTORS

Anders Engstrom, Lindome, Sweden, assignor to Victor Hasselblad AB, Gothenburg, Sweden

Filed May 25, 1977, Ser. No. 800,548
Claims priority, application Sweden, May 25, 1976, 7605954
Int. Cl.[2] H05B *39/10, 41/46*
U.S. Cl. 315—89 **8 Claims**



1. An automatic lamp-changing system for projectors incuding

(a) a longitudinally movable lamp carrier, said lamp carrier having

(b) at least two lamp stations longitudinally spaced from each other in the direction of movement of said lamp carrier, each lamp station having a sliding contact,

(c) index means for indexing said lamp carrier in a plurality of successive service positions corresponding to the number of lamp stations on said lamp carrier,

(d) biasing means for biasing said lamp carrier from one service position to a succeeding service position, said indexing means including

a lock having

(e) an electromagnetic lock release,

(f) an electronic control circuit including

(g) a photosensitive CdS cell positioned to receive light from a lamp in the service position,

(h) release means in said circuit responsive to a change in current in said photosensitive CdS cell to energize said electromagnetic lock release, whereby the bias means is free to move said lamp carrier to a succeeding service position,

(i) a stationary contact spring disposed adjacent the sliding contacts on the lamp carrier, said spring supplying a current to the sliding contact of the lamp station in the service position, and

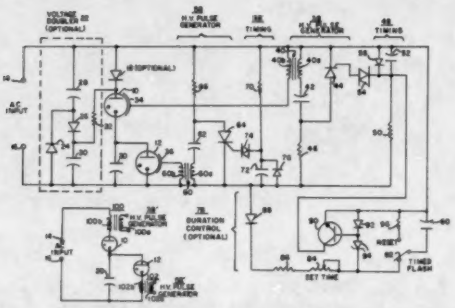
(j) a first switch controlling the current supplied to the lamp stations and a second switch controlling the current supplied to the electronic control circuit, said first and second switches interconnected for simultaneous operation.

4,142,130

MULTIFLASH OPERATING CIRCUIT DIRECTLY COUPLED TO AC SOURCE

Jeffrey D. Ingalls, Ipswich, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 29, 1977, Ser. No. 865,564
Int. Cl.[2] H05B *41/34, 41/16*
U.S. Cl. 315—188 **8 Claims**



1. A multiflash operating circuit comprising, in combination:

a source of AC voltage having first and second terminals;

first and second arc discharge flashlamps connected in series with each other;

series circuit means connecting said series connected lamps directly across the first and second terminals of said AC source;

a storage capacitor means connected between the junction of said first and second lamps and the second terminal of said AC source;

respective means for coupling trigger pulses to said first and second lamps; and

means connected to and energized by said AC source for generating and alternately applying a succession of high voltage trigger pulses through said respective coupling means to said first and second lamps, each trigger pulse applied to said first lamp effecting an arc path therethrough for charging said capacitor means, and each trigger pulse applied to said second lamp effecting an arc path therethrough for discharging said capacitor means, said charge and discharge producing trigger pulses being generated successively and applied in alternate sequence to said first and second lamps.

4,142,131

COLOR PICTURE TUBE

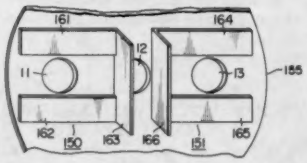
Kunio Ando, Mobara; Ryoichi Hirota, Yokohama; Kuniharu Osakabe, Mobara, and Koichi Maruyama, Matsuzawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 760,122
Claims priority, application Japan, Nov. 12, 1975, 50-135062; Nov. 12, 1975, 50/135063
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—368 **15 Claims**

1. A color picture tube device comprising:

a color picture tube having a target and three electron guns aligned in line so as to provide a pair of side electron guns and a center electron gun producing three electron beams directed to said target;

deflecting means coupled to said color picture tube for simultaneously generating a first deflection magnetic field for deflecting beams of electrons emitted from said electron guns in a first direction and a second deflection magnetic field for deflecting said beams of electrons in a second direction substantially perpendicular to said first direction so as to scan said target, said deflecting means producing such a first distribution of deflection magnetic field in the first direction that the side beams emitted from the side electron guns are deflected more greatly than the central beam emitted from the center electron gun and a second distribution of deflection magnetic field in the second direction such that the central beam is deflected more greatly than the side beams;



first magnetic field modifying means disposed in a space downstream of the electron guns in which the deflection magnetic fields prevail for causing the deflection magnetic field in the first direction acting on the side beams to be relatively weakened in relation to that acting on the central beam; and

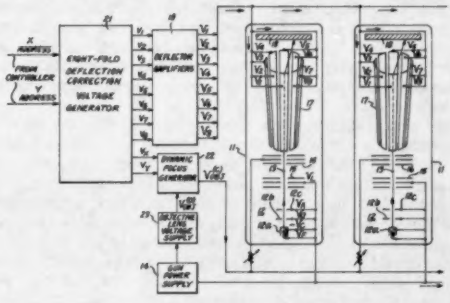
second magnetic field modifying means disposed in said space for causing the deflection magnetic field in the second direction acting on the central beam to be weakened in relation to that acting on the side beams.

4,142,132

METHOD AND MEANS FOR DYNAMIC CORRECTION OF ELECTROSTATIC DEFLECTOR FOR ELECTRON BEAM TUBE

Kenneth J. Harte, Carlisle, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jul. 5, 1977, Ser. No. 812,981
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—370 **63 Claims**



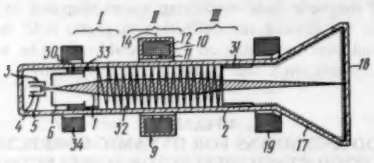
1. An electron beam tube electrostatic deflection system comprising an evacuated housing, electron gun means disposed at one end of the evacuated housing for producing a beam of electrons, lens means secured within the evacuated housing intermediate the electron gun means and the opposite end of the housing and disposed along the path of the beam of electrons for focusing and centering the beam of electrons into a finely focused pencil-like beam of electrons, eight-fold deflector means secured within the housing and disposed about the path of the finely focused beam of electrons, said eight-fold deflector means comprising eight electrically conductive spaced-apart members which are electrically isolated one from

the other and annularly arranged around the center electron beam path, means for applying deflection electric potentials to the respective members of the eight-fold deflector means for electrostatically deflecting the finely focused electron beam to a desired point on a target plane located at an opposite end of the evacuated housing from the electron gun means, and means for applying correction electric potentials to the respective members of the eight-fold deflector means in conjunction with the deflection electric potentials to minimize electron beam spot aberration at the target plane, said means for applying correction electric potentials to the respective members of the eight-fold deflector means comprising means for applying two different quadrupole correction electric potentials to selected ones of the eight-fold deflector members and means for applying an octupole correction electric potential to all eight deflector members.

4,142,133
CATHODE-RAY TUBE WITH VARIABLE ENERGY OF BEAM ELECTRONS

Genrikh D. Balandin, ulitsa Toentralnaya 4a, kv. 23, Fryazino Moskovskoi oblasti, and Nikolai G. Rumyantsev, ulitsa Konsomolskaya 7/1, kv. 106, Schelkovo Moskovskoi oblasti, both of U.S.S.R.

Division of Ser. No. 734,272, Oct. 20, 1976, Pat. No. 4,044,282, which is a continuation of Ser. No. 515,633, Oct. 17, 1976, abandoned. This application Jun. 8, 1977, Ser. No. 804,815
Int. Cl.[2] H01J *29/56, 29/64*
U.S. Cl. 315—382 **2 Claims**

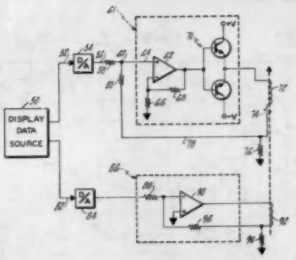


1. A cathode-ray tube with variable energy of electrons of its beam, comprising: a glass bulb with a flaring portion; and electron source disposed in said bulb; electron accelerating means arranged in said bulb downstream of said electron source along the beam axis; electron focusing means arranged downstream of said electron accelerating means along the beam axis and cooperating with said electron accelerating means to form an electron beam; a magnetic lens with constant magnetic field intensity, forming part of said electron focusing means and having a median plane; an electrostatic lens defined in said electron focusing means, comprising two axisymmetric electrodes; said two electrodes having ends arranged on either side of said median plane of said magnetic lens, the distance therebetween exceeding the diameter of an end of a smaller one of said electrodes; said electrodes being electrically connected to each other by means for setting up a distributed electric field disposed between said electrodes; a first one of said electrodes being electrically connected with said electron accelerating means; screen means disposed in said flaring portion of said bulb and being coated with a luminophore, having luminescence which varies with a change of electron beam energy impinging upon said screen; a second one of said electrodes being electrically connected with said screen; electron beam deflecting means arranged downstream of said electron focusing means along the beam axis; a.d.c. voltage source connected with said accelerating means, adapted to create a potential on said first electrode; an a.c. voltage source connected to said screen for creating a potential on said second electrode, which latter potential is different from the potential of said first electrode, so that while altering the potential of said screen, and of said second electrode, a change of optical force formed by said electrodes being automatically made up for a reverse conjugated alteration of an optical force of said magnetic lens, and under different values of the potential of said screen, consecutively changed in time resulting in automatic invariable focusing of said beam on said screen; and other power sources electrically connected with said electron source, said deflecting means and said magnetic lens.

4,142,134
DIRECT INTEGRATION YOKE DRIVER FOR A HIGH SPEED ALPHANUMERIC DISPLAY SYSTEM

Glenn C. Waehner, Riverside, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 27, 1977, Ser. No. 810,652
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—387 **8 Claims**



1. A driver circuit for the deflection system of a CRT, said deflection system including the magnetic deflection yoke with at least a pair of windings which create coacting magnetic flux fields, at least one winding including a sense resistor for shunting the yoke current to ground; comprising:

a high speed means for receiving a high frequency analog information, and having an output for coupling to one winding of said magnetic yoke, said winding being coupled to a sense resistor, including:

combining means having at least a first and second input and, in operation, adding the signals impressed thereon, and having an output;

power amplifier means coupled to said output of said combining means, for providing a signal to said winding of said magnetic deflection yoke; and,

feedback means for sensing the current flowing through said sense resistor and for feeding back a signal which is proportional to the current through said winding to said second input of said combining means; and

a low speed means for receiving low frequency information including an output for coupling to said other winding of said magnetic deflection yoke, said low speed means creating a signal waveform suitable for generating a positioning magnetic flux field proportional to the input signal impressed thereon.

4,142,135
FORK LIFT TRUCK WITH BALANCE WEIGHT USING BATTERIES AS POWER SOURCE

Kazuya Fujita, Tokyo, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1977, Ser. No. 792,467
Int. Cl.[2] H02P *5/00*
U.S. Cl. 318—139 **10 Claims**

8. In a self-propelled material handling vehicle, in combination:

a ferromagnetic balance weight mounted on said vehicle;

a compound electric motor for driving said vehicle, and including an armature, a shunt field winding, and a series field winding;

a battery mounted on said vehicle for driving said motor;

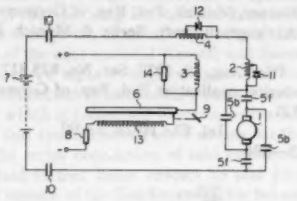
and speed control means for said motor and comprising:

a current-limiting reactor having a reactor core element and a reactor winding, said reactor core element comprising said ferromagnetic balance weight, said reactor winding

connected in circuit between said battery and said series field winding to prevent a sharp current rise in said motor;

a variable resistor connected in circuit with said shunt field winding and said battery for regulating shunt field current;

an accelerator pedal actuable by a vehicle operator for operating said variable resistor whereby the resistance value of said variable resistor changes in proportion to actuation of said pedal;



on-off switch means connected in circuit between said battery and said motor and actuatable by said pedal;

a first diode connected to short-circuit at least part of said series field winding during a power regeneration braking operation;

a second diode connected to short-circuit at least part of said reactor winding during a power regeneration braking operation for preventing an irregular surge in the circuit;

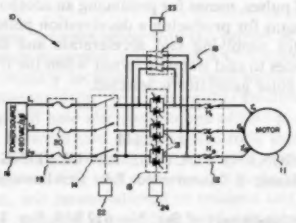
and a discharge resistor connected in parallel with said shunt field winding.

4,142,136

CONTROL CIRCUIT FOR STARTING A MOTOR

James S. Witter, Clarence Center, N.Y., assignor to Mollenberg-Betz Machine Company, Buffalo, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,926
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—779 **7 Claims**



1. In a power supply circuit having a motor arranged in series with an SCR starter and a power source, and having a bypass circuit arranged in parallel with said SCR starter, said power supply circuit further including a main contactor operatively arranged between said SCR starter and said power source, and a bypass contactor arranged in said bypass circuit, the improvement which comprises:

a control circuit operatively associated with said power supply circuit for limiting the in-rush current supplied to said motor when said motor is initially started, and for supplying current to said motor through said bypass circuit after said motor has reached its operating speed, said control circuit including

first branch circuit means arranged to be supplied with a control voltage and having a selectively operable control switch, having a main operator operatively arranged to close said main contactor when said control switch is closed, and having a first timer for measuring a first time interval after said main operator has been operated;

second branch circuit means arranged in parallel with said first branch circuit means and having a trigger circuit operatively arranged to fire said SCR starter after said first time interval, and having a second timer for measuring a second time interval after said trigger circuit has been operated; and

third branch circuit means arranged in parallel with said first branch circuit means and having a bypass operator operatively arranged to close said bypass contactor after said second time interval, having a third timer for measuring a third time interval after said bypass operator has been operated, and having means for opening said second branch circuit after said third time interval;

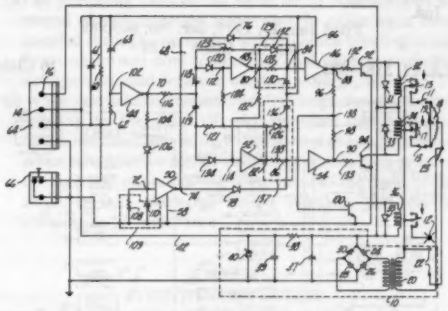
whereby said SCR starter may be removed from said power supply circuit after said third time interval.

4,142,137

OPERATOR MOTOR CONTROL

Kenneth F. Umpleby, Ann Arbor, and Maurice R. Brackney, Warren, both of Mich., assignors to Multi-Elmac Company, Novi, Mich.

Filed Dec. 22, 1977, Ser. No. 863,080
Int. Cl.[2] H02P *1/42*
U.S. Cl. 318—283 **11 Claims**



1. In a bi-directional motor control circuit of the type having a power supply, first and second power switches for alternately completing circuits of opposite sense between the power supply and the motor for direction control, an electronic flip-flop responsive to successively applied signals to reverse its state of conductivity and the improvement comprising:

first and second delay means connected between respective stages of the flip-flop and said first and second power switches to delay closing actuation of each switch for a sufficient period to insure opening of the other power switch prior to closing of the actuated switch.

4,142,138

MOTOR CONTROL

David C. Taylor, Carmel, N.Y., and Mark W. Hayden, Stratford, Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1977, Ser. No. 792,709
Int. Cl.[2] H01R *39/43*
U.S. Cl. 318—542 **6 Claims**

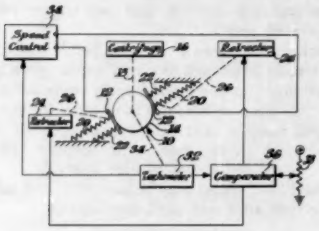
1. Apparatus for smoothing the acceleration and deceleration characteristics of an electric motor having a commutator and an associated brush and brush holder, said apparatus comprising:

first means for urging said brush against said commutator with a force of a first value,

adjusting means associated with said first means for adjusting said force to a second value less than said first value, and

means responsive to the speed of said motor being less than a predetermined value for actuating said adjusting means

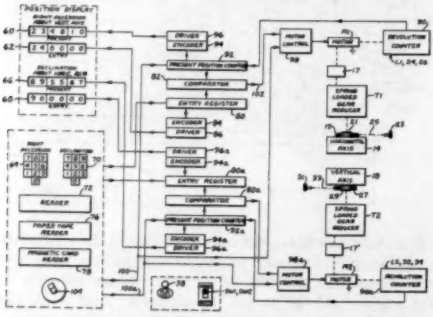
to reduce said force from said first value to said second value, thereby to smooth the acceleration and deceleration characteristics of said motor at speeds less than said predetermined value.



4,142,139
SEARCH MOUNT FOR TELESCOPE AND METHOD OF OPERATION

Mathew A. Slaats; Alan B. Welsh, and Wade R. Bray, all of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 27, 1977, Ser. No. 809,989
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **16 Claims**

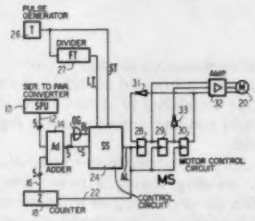


1. A search mount for a telescope or the like comprising:
support means,
first and second members and pivot axis means for interconnecting said members for rotational movement relative to said support means about one pivot axis and for rotational movement relative to each other about another pivot axis,
first and second motor means for causing said relative rotational movement about said axes,
detector means for directly sensing the number of revolutions made by each motor means and producing first and second series of momentary signals being proportional to the number of revolutions of the first and second motor means, respectively,
first and second counter means for counting respective said first and second momentary signals,
first and second register means for storing and displaying data representing the desired positions for said first and second elements, respectively,
first and second control means operable for energizing said first and second motor means, respectively,
first comparator means connected to said first register means and said first counter means for disabling said first control means when the values in said first register means and said first counter means are equal,
second comparator means connected to said second register means and said second counter means for disabling said second control means when the values in said second register means and said second counter means are equal, and
first and second substantially zero backlash speed reducing means operatively connected between said first and second motor means and said first and second elements, respectively.

4,142,140
STEPPING MOTOR CONTROL CIRCUIT

Wolfgang Wiesner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 825,817
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638521
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—696 **12 Claims**

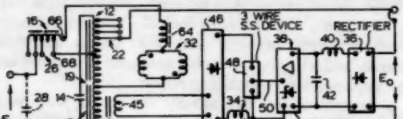


1. A stepping motor control circuit including a first generator for producing pulses having a pulse repetition rate less than the maximum starting frequency of said stepping motor, a second pulse generator for producing pulses having a pulse repetition rate greater than said maximum frequency, connecting means connected to said stepping motor for supplying said motor with pulses either at the frequency of said first pulse generator or at the frequency of said second pulse generator, control means for said connecting means for selecting the frequency of pulses, means for producing an acceleration pulse sequence, means for producing a deceleration pulse sequence, and means for supplying said acceleration and deceleration pulse sequences to said stepping motor when the frequency of said second pulse generator is selected.

4,142,141
FERRORESONANT VOLTAGE REGULATING CIRCUIT

Alfred M. Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Continuation-in-part of Ser. No. 612,869, Sep. 12, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,590
Int. Cl.[2] G05F *1/38*
U.S. Cl. 323—6 **6 Claims**



1. In a ferroresonant voltage regulating circuit having an AC input voltage and a regulated AC output voltage; a constant voltage transformer with an input and an output side, an iron core having an air gap therein, and an overwind coil; a linear reactor in series with said AC input voltage, and a capacitor across said constant voltage transformer so that said linear reactor, capacitor and iron core transformer form a tuned

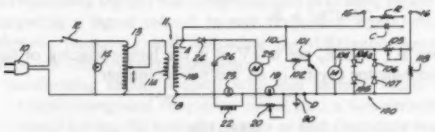
ferroresonant circuit; synchronous switch means connected in shunt across at least a portion of a winding of said constant voltage transformer and having a control coil in series with a three-wire semiconductor device arranged with voltage sensing and reference means connected across the output of said voltage regulating circuit so that said three-wire semiconductive device and said control coil are conductive at no-load conditions of said voltage regulating circuit, and said synchronous switch is conductive when said control coil is conductive; where said constant voltage transformer is operated substantially linearly, the operating limits of the core and air gap of said constant voltage transformer being substantially the saturating limits of the core material thereof; said linear reactor in series with said AC input voltage being at least two taps, one of which is connected in said tuned ferroresonant circuit and the other of which is connected in series with a further linear reactor and said synchronous switch means, so that the connection of the series connection of said synchronous switch means and said further linear reactor to said transformer is through that portion of the first linear reactor between the two taps thereof which are connected to the series connection of said synchronous switch means and further linear reactor and said ferroresonant tuned circuit, respectively.

4,142,142

HIGH VOLTAGE A.C. TEST SET FOR MEASURING TRUE LEAKAGE CURRENT

Luis A. Arce, Lakewood, Calif., assignor to G. L. Collins Corporation, Long Beach, Calif.

Filed Feb. 9, 1977, Ser. No. 767,207
Int. Cl.[2] G01R *31/02, 31/12, 27/00*
U.S. Cl. 324—54 **9 Claims**



1. Circuitry for association with test probes of current leakage measuring apparatus utilizing an A.C. voltage power supply, said circuitry including a transistor having a base electrode, a collector electrode and an emitter electrode, means for connecting said base electrode to one of said probes, a meter connected between said collector electrode and said emitter electrode, a resistor connected in parallel with said meter, means for connecting said collector electrode to the other of said probes, and means adapted to connect said transistor to said power supply for rendering said transistor alternately conducting and nonconducting during succeeding half cycles of said A.C. voltage to cause said meter to measure only the component of the leakage current between said test probes as is in phase with said A.C. voltage.

4,142,143

LIGHTNING GROUND SYSTEM ATTACHABLE ADMITTANCE TESTING INSTRUMENT

Richard A. Daniel, Kingston, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1977, Ser. No. 852,895
Int. Cl.[2] G01R *31/02, 27/00*
U.S. Cl. 324—51 **6 Claims**

1. An instrument for measuring admittance comprising:

(a) a first transformer core having a transmitter and a reference winding, capable of coupling with a cable to be tested;

(b) an oscillator, the output of which is coupled through said transmitter winding to said first transformer core to impart an alternating current voltage in said reference winding and in said cable;

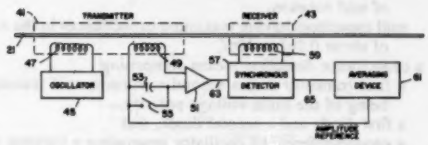
(c) an amplifier, one input being connected to one side of said reference winding;

(d) a phase shifting component;

(e) selector means for selectively coupling the output of the other side of said reference winding directly or through said phase shifting component to the other input of said amplifier;

(f) a second transformer core having a receiver winding, capable of coupling with said cable being tested;

(g) detection means for multiplying input electrical signals, one input being connected to the output of said amplifier



and the other input being coupled through said receiver winding to said second transformer core;

(h) an averaging device, one input being connected to the output of said detection means and the other input being coupled through one side of said reference winding to said first transformer core to compare said reference winding voltage with said receiver winding voltage; whereby

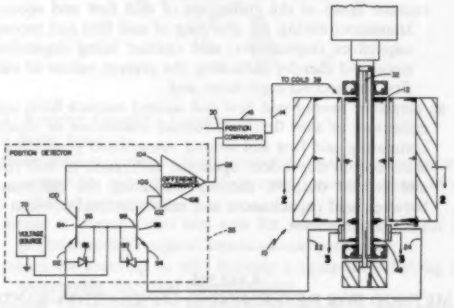
(i) when said selector means directly couples said reference winding to the input of said amplifier said averaging means indicates the resistive component of admittance and when said selector means couples said reference winding through said phase shifting component to the input of said amplifier said averaging means indicates the reactive component of admittance.

4,142,144

POSITION DETECTOR

Bruce E. Rohr, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Nov. 7, 1977, Ser. No. 849,018
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **9 Claims**



6. A transformerless differential capacitance detection device useful in determining the rotational position of a galvanometer comprising:

a first and a second variable capacitor, said capacitors comprising:

a rotor and four stators,

said rotor rotating about its center and being coupled to a galvanometer so that the rotational position of said rotor is determined by the rotational position of said galvanometer,

said stators being circumferentially located about said rotor in diametrically opposing pairs, and

one said pair being connected together to comprise a first plate of said first capacitor, another said pair being connected together to comprise a first plate of said second capacitor and said rotor comprising a common second plate to both said first and second capacitors,

the capacitance of said first and second capacitors being dependent upon the mutually occluded areas between said rotor and said stators comprising said first plates of said capacitors so that said capacitances are dependent upon said rotational position of said galvanometer, and

said capacitances of said first and second capacitors respectively increasing and decreasing for one direction of rotation, the reverse occurring for the other direction of said rotation,

said capacitors having maximum capacitances in the range of about 0.5pf to 10pf,

a capacitance detection means comprising

a first transistor and a second transistor, said transistors being of the same voltage polarity,

a first diode and a second diode, and

a ground-referenced oscillator generating a varying voltage,

said first diode being connected between the base and the emitter of said first transistor and said second diode being connected between the base and the emitter of said second transistor, said diodes being connected in the opposite direction to the internal base-emitter diodes of said transistors,

said varying voltage source being connected to said bases,

the ungrounded side of said first capacitor being connected to said emitter of said first transistor and the ungrounded side of said second capacitor being connected to said emitter of said second transistor, and

the collectors of said first and second transistors providing respectively first and second outputs,

said varying voltage source driving said bases of said first and second transistors, thereby driving said first and second transistors together into alternately conducting and non-conducting states, and

said varying voltage appearing across said first and second capacitors, said first and second capacitors being charged through said first and second transistors respectively when said transistors are in the conducting state and discharged through said first and second capacitor discharge means respectively when said transistors are in the non-conducting state, so that

current flows in the collectors of said first and second transistors during the charging of said first and second capacitors respectively, said current being dependent upon and thereby indicating the present values of said first and second capacitors, and

an amplifier having said first and second outputs from said collectors of said first and second transistors as inputs, comparing said first and second outputs and generating a third output dependent upon the difference in said first and second outputs, thereby indicating the difference between said capacitances and said rotational position of said galvanometer.

4,142,145
METHOD FOR DETERMINING CONDUCTION-BAND EDGE AND ELECTRON AFFINITY IN SEMICONDUCTORS

George A. Haas, Alexandria, Va.; Arnold Shih, Gaithersburg, and Richard E. Thomas, Riverdale, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

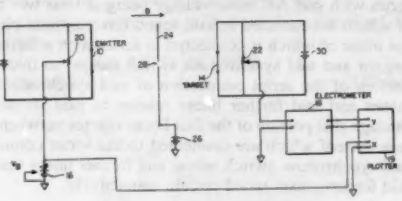
Filed Dec. 22, 1977, Ser. No. 863,362
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—62 **4 Claims**

1. A method for determining the position of the conduction-band edge E_c with respect to the Fermi level in a target area of the surface of a single-crystal semiconductor comprising the steps of:

(a) directing a beam of low-energy electrons from an emitter onto said target area of the surface of said semiconductor;

(b) varying the energy of said low-energy electrons from the Fermi level of said target area through an energy corresponding to the energy of at least one unallowed energy state in the conduction band of said target area, said unallowed energy state being above the vacuum level of said target area;

(c) measuring the current collected by said semiconductor due to the incidence of said low-energy electrons on said target area;



(d) correlating the electron energy above the Fermi level for said low-energy electrons with the current collected by said semiconductor; and

(e) determining the energies $E\downarrow$ of said low-energy electrons which correspond to minima in the current collected by said semiconductor, said minima corresponding to unallowed energy states, said minima being related to said position of said conduction-band edge E_c by the formula

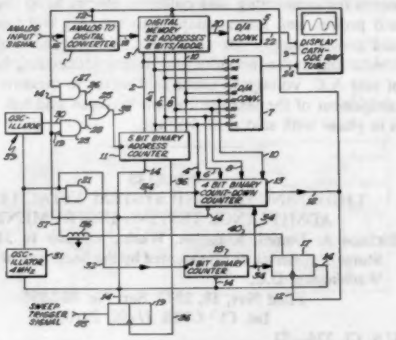
$$E\downarrow = (37/d^2)n^2 + E_c$$

where $E\downarrow$ and E_c are in eV, d is the lattice spacing of said semiconductor crystal in Å, and n is an integer.

4,142,146
DIGITAL APPARATUS FOR WAVEFORM MEASUREMENT

Robert W. Schumann, Madison, and Gary L. Wells, Middleton, both of Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Jul. 7, 1975, Ser. No. 593,755
Int. Cl.[2] G01R *23/16*
U.S. Cl. 324—77 A **12 Claims**



1. In waveform measurement apparatus including means for taking a time sequence of voltage samples of a signal, and means for displaying the sampled voltages to provide a representation of the signal, the improvement comprising: means for taking the voltage samples at random times for providing a

scattered display to prevent aliasing when the signal includes frequency components greater than half the sampling frequency.

4,142,147

METHOD AND SYSTEM FOR TESTING THE ACCURACY OF AN ELECTRONIC CLOCK

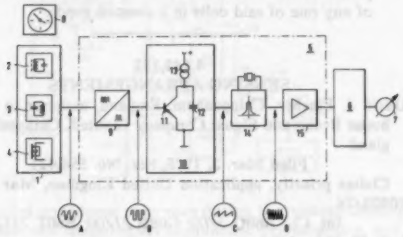
Manfred Stein, Eschborn, Fed. Rep. of Germany, assignor to Quarz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1977, Ser. No. 837,281

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646511

Int. Cl.[2] G01R *23/14*

U.S. Cl. 324—79 R **11 Claims**



1. In a system for testing the accuracy of an oscillator of an electronic clock including antenna means for detecting the output of the clock oscillator and producing a frequency signal corresponding thereto and comparing and indicating means for comparing a signal related to said frequency signal with a reference frequency and indicating the difference therebetween, the improvement comprising

transforming means coupled with said antenna means for transforming said frequency signal into a non-sinusoidal signal having the same frequency as said frequency signal to produce harmonic components thereof; and

filter means coupled between said transforming means and said comparing and indicating means for filtering said non-sinusoidal signal to pass a harmonic component of said non-sinusoidal signal having a frequency associated with said reference frequency to said comparing and indicating means whereby said system can be utilized to test clock oscillators operating at various frequencies of which said reference frequency is an integral multiple.

4,142,148

REMOTE TRANSDUCER MONITORING SYSTEM

Fritz A. Johansson, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed May 11, 1977, Ser. No. 795,696

Int. Cl.[2] G01R *27/08*; E21B *47/06*; G08C *19/02*

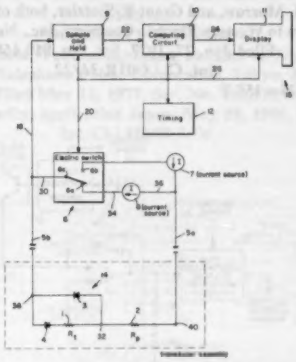
U.S. Cl. 324—140 R **7 Claims**

5. A system for monitoring physical phenomena comprising:

a transducer assembly means comprising at least two diodes and at least two transducer elements, each of said transducer elements varying resistance as a measurement of change of said physical phenomena, one of said diodes being connected in series with said transducers, and the other said diode being of opposing polarity to said one of said diodes connected in series with one of said transducers, opposite poles of said diodes having common junction point;

at least two current sources connected to said transducer assembly by means of a communciation cable;

an electronic switch connected to said current sources and said transducer assembly by means of said communications cable controlling the current flow therethrough; and



means for processing observed voltages resulting from current flow through said transducer assembly means to monitor said physical phenomena.

4,142,149

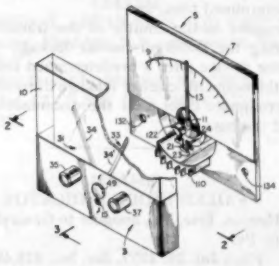
CONTROL METER USABLE AS A POTENTIOMETRIC OR PHOTOELECTRIC DEVICE

Julius Nador, Plainfield, N.J., assignor to Sangamo Weston, Inc., Newark, N.J.

Filed May 12, 1977, Ser. No. 796,272

Int. Cl.[2] G01R *1/02, 5/00*

U.S. Cl. 324—157 **39 Claims**



1. A meter apparatus comprising:

a meter housing;

measurement means rotatably mounted in said housing about an axis for movement in response to measurements of a selected parameter;

means rotatable about said axis for setting the limits of a predetermined range of values of said parameter;

means for securing to said housing a component having a measurable electrical characteristic;

means for attaching a photoelectric sensor to said range setting means;

means for fixedly securing illuminating means in said housing to direct light at said photoelectric sensor means;

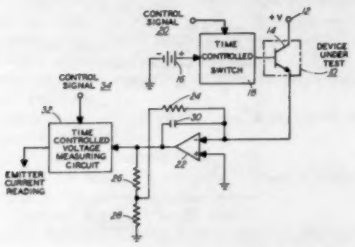
means for securing light interrupting means to said measurement means for movement therewith between a light interrupting and a light transmitting position; and

said range setting means including first contact means connectable to said photoelectric sensor means and disposed for detecting a portion of the electrical characteristic value of said component corresponding to the position of said range setting means about said axis.

4,142,150
HIGH-SPEED MEASUREMENT OF I_{CEO} IN TRANSISTORS AND OPTO-ISOLATORS

Richard H. Morrow, and Grant F. Stetzler, both of Temple, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,468
Int. Cl.² G01R *31/22*
U.S. Cl. 324—158 T **17 Claims**



1. An apparatus for measuring the collector-emitter leakage current of a transistor device when the base is open, wherein the device has a Miller Capacitance equal to the collector-base junction capacitance multiplied by the current gain of the transistor device, comprising:

means for applying a D.C. voltage between the collector and the emitter of the transistor device to flow a current through the device to charge the Miller Capacitance;

means responsive to a control signal for applying a D.C. voltage to the base of the transistor device to induce a current to flow through the device to increase the charging rate of the Miller Capacitance;

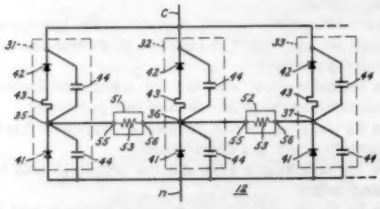
means responsive to the control signal for disconnecting the D.C. voltage to open the base after it has been applied for a predetermined time; and

means coupled to the emitter of the transistor device for measuring the collector-emitter leakage current of the transistor device after a predetermined time sufficient to allow the collector-emitter leakage current to stabilize to an approximate level after the disconnecting means has opened the base.

4,142,151
FAILED DIODE INDICATOR

Wilbur O. Hansen, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jul. 25, 1977, Ser. No. 818,483
Int. Cl.² G01R *31/02*
U.S. Cl. 324—158 D **10 Claims**



1. In a malfunction indicator for an electric power network connected between a source of alternating voltage and a d-c load, said network having at least two branch circuits connected in parallel relationship with one another, each of said branch circuits comprising at least first and second semiconductor power rectifier cells serially interconnected in polarity agreement, the improvement comprising:

a. a resistor comprising a cylindrical body, terminals at opposite ends of said body, and a resistive element of relatively high ohmic value connected between said terminals;

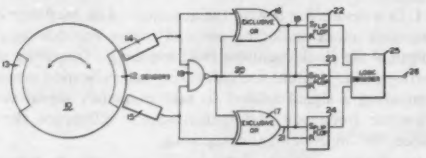
b. connecting means for connecting the terminals of said resistor to normally equipotential points intermediate said first and second cells of the respective branch circuits, whereby during normal balanced conditions there is negligible electric current in said resistive element; and

c. heat sensitive material attached to the exterior of said cylindrical body for visually indicating that current has been conducted by said resistive element, said material being characterized by a noticeable and irreversible change in appearance whenever it is heated to a predetermined high temperature by heat generated in said resistive element when conducting current in response to an appreciable potential difference between said intermediate points of the two branch circuits as a result of the failure of any one of said cells in a shorted mode.

4,142,152
SENSING ARRANGEMENTS

David J. Fincher, Chippenham, England, assignor to Westinghouse Brake and Signal Company Limited, Chippenham, England

Filed Mar. 3, 1975, Ser. No. 554,421
Claims priority, application United Kingdom, Mar. 8, 1974, 10503/74
Int. Cl.² B60Q *5/00*; G08B *21/00*; B60T *7/12*
U.S. Cl. 324—165 **9 Claims**



1. Directional sensing apparatus comprising, first and second relatively movable sections, said first section having first and second sensors, said second section having at least one sensor actuator being so proportioned and arranged so that the relative positions of said first and second sections result in neither of said first and second sensors to be actuated, result in either of said first and second sensors to be actuated and result in both of said first and second sensors to be actuated during relative movement of said first and second sections, and logic means including a plurality of gates which control the condition of a ring counter and being responsive to the actual condition of said first and second sensors to determine the relative directional movement of said first and second sections.

4,142,153
TACHOMETER FOR MEASURING SPEED AND DIRECTION OF SHAFT ROTATION WITH A SINGLE SENSING ELEMENT

Larry B. Smith, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 17, 1977, Ser. No. 769,750
Int. Cl.² G01P *3/52*
U.S. Cl. 324—165 **8 Claims**

1. Apparatus for measuring rate and direction of motion comprising:

motive means operable in clockwise and counter-clockwise directions,

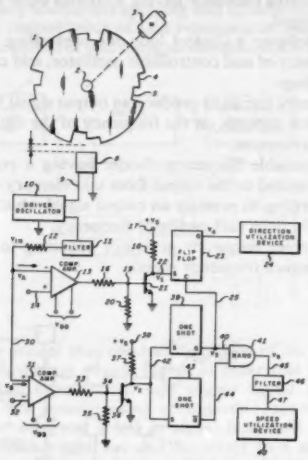
rotor means coupled for rotation by said motive means and having an electrically conductive circular peripheral portion,

coil means adjacent said circular peripheral portion for exciting eddy currents therein,

said circular portion having spaced-apart asymmetric por-

tions therein each comprising first and second discrete contiguous radial perturbations of said circular peripheral portion,

said coil means additionally having first and second discrete



reflected impedance responses during the passage thereby of each said spaced-apart asymmetric perturbations, and

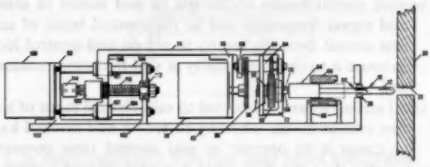
first circuit means responsive to said first and second discrete reflected impedance responses for yielding a measure of said rate of rotation.

4,142,154

HOLE TESTER USING A PERMEABLE PROTECTIVE SLEEVE INSERTIBLE IN SAID HOLE AND ADAPTED TO RECEIVE A RELATIVELY MOVABLE EDDY CURRENT PROBE

James C. Couchman, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Sep. 16, 1977, Ser. No. 833,942
Int. Cl.² G01R 33/12
U.S. Cl. 324—219 **25 Claims**



1. A sleeve device forming a reference surface of generally known smoothness and thickness at the interiors of holes to be tested for improving eddy current inspection of hole quality in structures comprising:

a durable, substantially rigid, thin wall hollow sleeve open at least at one end for receiving an eddy current probe for sliding movement therein during hole testing,

said sleeve being cylindrical along its length and adapted to be inserted into a hole to be tested independently of an eddy current probe and sized to fit closely within said hole,

the sleeve wall being of substantially uniform thickness along its length and its inside and outside surfaces being polished to substantially known smoothness to avoid marring of an eddy current probe moved therein or marring of the interior of the hole to be inspected, and to substantially eliminate lift-off like noise signals from the probe due to hole surface roughness,

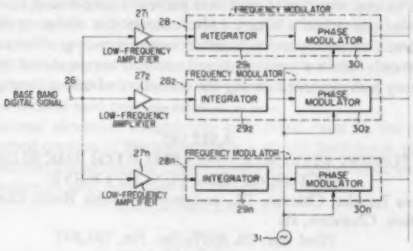
the sleeve being formed from an electromagnetically permeable material which permits electromagnetic field penetration through the sleeve wall to the desired depth in the material to be inspected.

4,142,155

DIVERSITY SYSTEM

Fumiyuki Adachi, Yokohama, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,870
Claims priority, application Japan, May 19, 1976, 51-57678
Int. Cl.² H04B 7/06
U.S. Cl. 325—47 **8 Claims**



7. A diversity system comprising:

(a) at least two angularly modulating transmitters;

(b) carriers in each transmitter being angularly modulated by a common baseband digital signal to different peak frequency deviations of said modulated carriers from each other; and

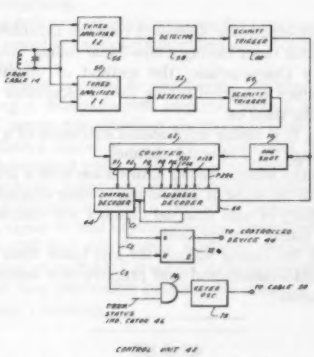
(c) said modulated carriers being transmitted from respective antennas connected to each transmitter.

4,142,156

CONTROL SIGNAL APPARATUS FOR CATV SYSTEM

Robert W. Freund, Flushing, N.Y., assignor to Veripen, Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,838
Int. Cl.² H04H 1/02; H04N 7/10
U.S. Cl. 325—309 **6 Claims**



1. In a cable television system having a central station with a television transmitter and a plurality of remote stations connected thereto via a television transmission cable, said remote stations having television receivers, apparatus for transmitting signals other than television signals between the central station and the remote stations comprising: at the central station, generating means for generating a controllably variable set of first pulses followed by a second pulse, said controllably variable set of first pulses including a first variable number of the

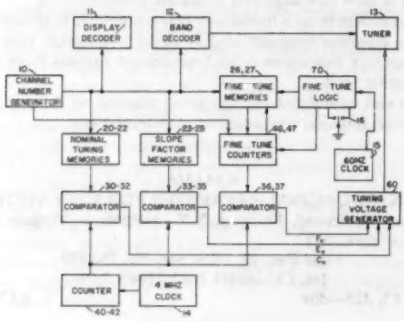
first pulses and representing the address of a remote station and a second variable number of the first pulses and representing data for said remote station and transmitting means for transmitting said pulses onto the television transmission cable; and, at each of said remote stations, receiving means for receiving said pulses, and decoding means, said decoding means including counting means for counting the number of received first pulses and sensing means connected to said counting means and response to the receipt of said second pulse for giving an address indication only when the first number of pulses represents the address of the particulate remote station, and indicating means responsive to the receipt of an address indication from said sensing means for giving data indication representing the second number of said first pulses, wherein said counting means comprises a binary pulse counter for counting the received first pulses and a count decoder for giving a first indication only when a predetermined count is accumulated by said binary pulse counter during the reception of said second pulse.

4,142,157

TUNING SYSTEM EQUALIZED WITH THE SLOPE FACTOR OF THE TUNING CURVE

Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 28, 1977, Ser. No. 791,897
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—464 **22 Claims**



14. In an all-electronic television receiver including a voltage controllable tuner having a non-linear tuning voltage-versus-frequency characteristic; the method of operating said tuner to produce equalized tuning for all receivable channels comprising the steps of:

developing first tuning information indicative of a first tuning voltage for a selected channel;

proportioning second tuning information with a scale factor related to the slope of said tuning voltage characteristic in the vicinity of said selected channel and indicative of a second tuning voltage; and

generating the tuning voltage for said tuner from said first tuning information and said proportioned second tuning information.

4,142,158

FREQUENCY SELECTION RECEIVER WITH VARIABLE TIME CONSTANT CONTROL LOOP

Pietro Belisomi, Pinerolo (Turin), Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Filed Jun. 21, 1977, Ser. No. 808,498
Claims priority, application Italy, Jun. 25, 1976, 68558 A/76
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—464 **8 Claims**

1. A signal receiver having a device for tuning the receiver to a signal frequency, selected from a plurality of receivable frequencies, of the type comprising:

means to select said signal frequency from said plurality of receivable frequencies,

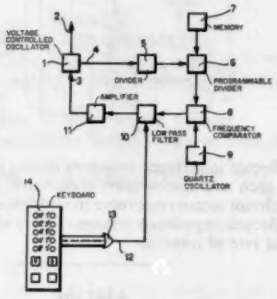
a controllable oscillator having a control input and at least one output,

means defining a control loop for controlling the output frequency of said controllable oscillator, said control loop including:

a memory circuit to produce an output signal the value of which depends on the frequency of the signal selected for reception,

an adjustable frequency divider having a control input connected to the output from said memory circuit, and operating to produce an output signal which is divided down from said oscillator frequency,

a reference frequency generator operating to generate a reference frequency signal,



means for comparing the output signal from said adjustable frequency divider with said reference frequency signal, to produce an output control signal, and

first circuit means operable with a first or a second time constant, and having a control input for applying signals to determine said first or second time constant, connected in said control loop between the output from said comparing means and the control input of said controllable oscillator,

second circuit means connected to said means to select said signal frequency and to the control input of said first circuit means whereby to act on said control loop to cause it to operate initially at said first time constant, and

third circuit means connected to said control input of said first circuit means whereby to act on said control loop to cause it to operate at said second time constant, greater than the first, after a predetermined period of time.

4,142,159

MISSING PULSE DETECTOR FOR A VARIABLE FREQUENCY SOURCE

Charles B. Ingram, Harriman, and John H. Lawhorn, Concord, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1977, Ser. No. 849,200
Int. Cl.[2] H03K 5/18, 5/156, 3/284
U.S. Cl. 328—120 **3 Claims**

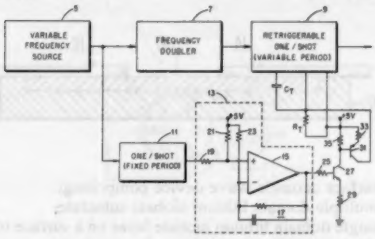
1. A missing pulse detector for detecting a loss of signal from a variable frequency source comprising:

a variable period retriggerable one-shot having a variable period control input;

means responsive to said variable frequency source for generating and applying a trigger signal to a triggering input

of said one-shot having twice the frequency of the signal from said source; and

means for generating a period control signal proportional to the frequency of the prevailing signal from said variable frequency source and applying said control signal to said period control input of said retriggerable one-shot such that the period of said retriggerable one-shot is maintained



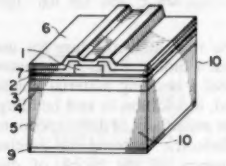
slightly greater than one-half the period of the prevailing signal frequency of said source in order that successive triggering signals from said trigger signal generating means will maintain said retriggerable one-shot in an unstable state and a loss of signal from said frequency source causes said one-shot to revert to a stable state within one period of the prevailing signal from said variable frequency source.

4,142,160

HETERO-STRUCTURE INJECTION LASER

Toshihisa Tsukada, Merima; Naoki Chinone, Kokubunji; Satoshi Nakamura, and Ryoichi Ito, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 339,919, Mar. 9, 1973, abandoned. This application Sep. 10, 1975, Ser. No. 612,103
Claims priority, application Japan, Mar. 13, 1972, 47-25644
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **2 Claims**



1. A hetero-structure injection laser pellet comprising:

a multi-layered semiconductor crystal having a first major surface at one end thereof and a pair of side faces at opposite sides thereof, said crystal including:

an active layer of one conductivity type which is sandwiched between a first layer of the one conductivity type and a second layer of the opposite conductivity type, said first and second layers being made of a semiconductor material different from that of said active layer thereby to form a pair of heterojunctions for generating a laser beam of a single mode produced when electric current passes through said active layer, said heterojunctions being parallel to one another, and an edge of the heterojunction between said active layer and said second layer extending and being exposed to said side faces of said crystal,

parallel end faces, each of which reflects a laser beam produced in said active layer, and with respect to which said active layer is perpendicular at said end faces,

a third layer of the one conductivity type disposed upon said first layer,

a fourth layer of the opposite conductivity type adjacent to said second layer, said fourth layer having said first major surface at one end thereof, said third and fourth layers being made of the same semiconductor material as that of said active layer,

wherein the minimum width of said first layer as measured in a direction between said side faces of said crystal is less than the width of said active layer between said side faces of said crystal, to substantially prevent divergence of said current applied thereto through said third layer, for confining said current to a restricted area of said active layer;

an insulating layer coated on said third layer and protectively overlying the interface of said first layer and active layer, while a portion of the upper surface of said third layer is exposed in the form of a narrow strip along a direction perpendicular to said end faces of said crystal,

a first electrode electrically connected to said first major surface of said crystal, and

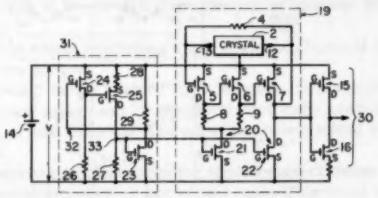
a second electrode electrically connected only to the exposed portion of the upper surface of said third layer, said current being applied through said first and second electrodes to said third and fourth layers.

4,142,161

CRYSTAL OSCILLATOR

John W. Gray, Guilford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Feb. 16, 1978, Ser. No. 878,218
Int. Cl.[2] H03B *5/36*
U.S. Cl. 331—116 R **5 Claims**



1. A crystal oscillator circuit energized by a supply voltage source comprising:

a tuning fork crystal vibrator means for providing an oscillatory signal at a series resonant frequency of said vibratory means; and

circuit means coupled to said crystal vibrator means comprising a direct-coupled amplifier having at least three FET stages for affording an inherent phase shift to the oscillatory signal at each FET stage and an additional predetermined phase shift to the oscillatory signal resulting from the interelectrode capacitance of each FET stage and resistance means for providing a regenerative feedback signal to said crystal vibrator means and for providing a DC bias stabilization feedback potential to a gate terminal of each FET stage for maintaining the oscillatory signal loop phase shift substantially constant with supply voltage variations.

4,142,162

LOW-DISTORTION DOUBLE SIDEBAND SUPPRESSED CARRIER MONOLITHIC MODULATOR

Christopher R. Huntley, Burnaby, Canada, assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jan. 3, 1978, Ser. No. 866,583
Int. Cl.[2] H03C *1/54*
U.S. Cl. 332—31 T **3 Claims**

1. A low-distortion double sideband suppressed carrier modulator, arranged to operate from the unbalanced output terminals of a carrier frequency source and from the unbalanced

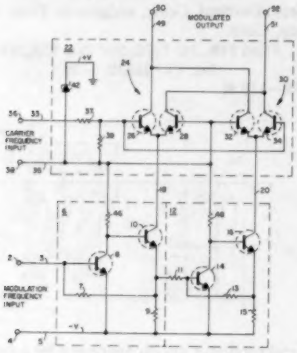
output terminals of a modulation frequency source, comprising:

a quad amplifier comprising:

a first differential amplifier including first and second transistors having their emitters connected together and to a first input terminal, having the base of said first transistor arranged for connection to a first output terminal of said carrier frequency source, having the base of said second transistor arranged for connection to a second output terminal of said carrier frequency source, having the collector of said first transistor connected to a first output terminal and the collector of said second transistor connected to a second output terminal; and

a second differential amplifier including third and fourth transistors having their emitters connected together and to a second input terminal, having the base of said third transistor connected to the base of said second transistor, having the base of said fourth transistor connected to the base of said first transistor, having the collector of said third transistor connected to said first output terminal and the collector of said fourth transistor connected to said second output terminal, whereby the modulated output signals from said first and second differential amplifiers are combined so as to increase the amplitude of the modulated signal at the modulator output terminals;

a first high impedance circuit comprising:



a fifth transistor having a base electrode connected to a third input terminal, and having an emitter electrode connected to a fourth input terminal, said third and fourth input terminals arranged for connection to a modulation frequency source; and

a sixth transistor having a base electrode connected to the collector electrode of said fifth transistor, having a collector electrode connected to the first input terminal, having a first feedback resistor connected between the emitter electrode of said sixth transistor and the base electrode of said fifth transistor, and a second feedback resistor connected between the emitter electrode of said sixth transistor and said fourth input terminal; and

a second high impedance circuit comprising:

a seventh transistor having the emitter electrode connected to the fourth input terminal, and having impedance means connected between the emitter electrode of said sixth transistor and the base electrode of said seventh transistor for providing an inverted modulation frequency input to said seventh transistor; and

an eighth transistor having the base electrode connected to the collector electrode of the seventh transistor, having the emitter electrode connected through a third feedback resistor connected to said fourth input terminal, having a fourth feedback resistor connected between the emitter electrode of the eighth transistor and the base of the seventh transistor and having the collector electrode connected to the second input terminal of the quad amplifier.

4,142,163

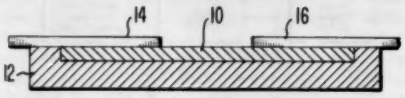
SURFACE ACOUSTIC WAVE DEVICE WITH REDUCED SPURIOUS RESPONSES

William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,203

Int. Cl.[2] H03H *9/26, 9/30, 9/32;* **H01L** *41/18*

U.S. Cl. 333—72 **10 Claims**



1. A surface acoustic wave device comprising:

(a) a multiple domain lithium niobate substrate;

(b) a single domain lithium niobate layer on a surface of said substrate;

(c) a launching interdigitated electrode pattern on said layer; and

(d) a receiving interdigitated electrode pattern on said layer.

4,142,164

DIELECTRIC RESONATOR OF IMPROVED TYPE

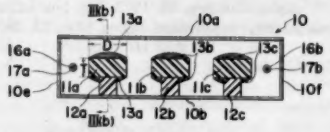
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 17, 1977, Ser. No. 797,858

Claims priority, application Japan, May 24, 1976, 51/66658

Int. Cl.[2] H01P *1/20, 7/06*

U.S. Cl. 333—73 W **7 Claims**



1. A dielectric resonator structure for use in a resonator, which comprises: a block of dielectric material; a support of dielectric material a bonding material bonding said block to said support; and, in addition to said bonding material, a mass of synthetic resin essentially of dielectric material bonded onto said block of dielectric material for precisely adjusting the resonance frequency of the block of dielectric material, whereby the resonance frequency can be decreased by an increase of the mass of synthetic resin and the resonance frequency can be increased by an decrease of the mass of synthetic resin.

4,142,165

ELECTROSTATIC COPYING MACHINE COMPRISING IMPROVED MAGNETIC BRUSH DEVELOPING-CLEANING UNIT

Seiichi Miyakawa, and Takashi Yano, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,223

Claims priority, application Japan, Mar. 25, 1976, 51-32939; Apr. 13, 1976, 51-41470

Int. Cl.[2] G03G *15/09, 21/00*

U.S. Cl. 355—14 **13 Claims**

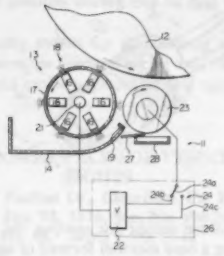
1. An electrostatic copying machine comprising:

a rotary photoconductive member;

a magnetic brush developing unit including a rotary magnetic brush operatively disposed adjacent to the photoconductive member and a developing tank containing a toner substance in which the magnetic brush is partially

immersed, the magnetic brush being arranged to develop a toner image on the photoconductive member by applying toner substance thereto and to clean the photoconductive member by removing toner subtance therefrom;

an electrode disposed closely adjacent to the magnetic brush between the developing tank and the photoconductive member in a direction of rotation of the magnetic brush; and



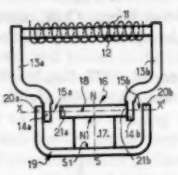
a voltage source for applying an electric potential between the magnetic brush and the electrode for controlling an amount of transfer of toner substance therebetween, the voltage source being constructed to vary the electric potential in such a manner that a predetermind portion of the toner substance is transferred from the magnetic brush to the electrode when the developing unit is being used for cleaning the photoconductive member.

4,142,166

ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC RELAY

Daniel Arnoux, Saint-Germain-en-Laye, France, assignor to Manufacture Francaise d'Appareils Electriques de Mesures dite Manumesure, Conches-en-Ouche, France

Filed Jul. 5, 1977, Ser. No. 812,601
Claims priority, application France, Jul. 9, 1976, 76 20988
Int. Cl.[2] H01H *51/22*
U.S. Cl. 335—81 **10 Claims**



1. An electromagnetic device having a coil, a stationary core passing through the coil and a plurality of stationary flux-conductive yokes, at least some of the yokes being connected to the core and at least one part being movable in longitudinal translation and spaced from the coil;

at least one permanent magnet having poles forming a single magnetic axis arranged perpendicular to the direction of displacement of the movable part; a flux-conductive armature secured to each magnet pole and perpendicular to the magnetic axis, at least one of the flux-conductive armatures shaped to define air-gap regions arranged on either side of the magnetic axis;

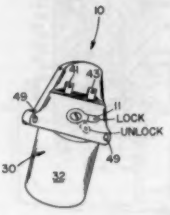
the stationary flux-conductive yokes having two ends parallel to the magnetic axis and located in respective air-gap regions; each flux-conductive armature having a respective end portion in contact with a respective stationary flux-conductive yoke end in at least one stable position of the movable part wherein the flux path of the magnet is defined exclusively in the stable position by flux-conducting elements.

4,142,167

SOLENOID OPERATED, OPPOSITELY ROTATED ACTUATOR

Carl H. Little, Jamestown, N.Y., and W. Rex Deshaw, Sparta, Mich., assignors to Keeler Corporation, Grand Rapids, Mich.

Filed Oct. 6, 1977, Ser. No. 839,930
Int. Cl.[2] H01H *3/42*
U.S. Cl. 335—190 **27 Claims**



1. A selectively activatable actuator for converting linear motion to alternating, opposite direction, rotary motion comprising: operated means for reciprocating said camming member;

said camming member being rotatable about at least a portion of said electrically operated means;

a pivot member and means for rotatably mounting said pivot member;

first and second spaced, cam follower means on said pivot member for alternate engagement with said camming member as said camming member is reciprocated in one direction to rotate said pivot member in opposite directions;

said pivot member including a pair of spaced electrical conductors thereon;

first contact means adapted for connection to a source of electrical energy and for separately electrically contacting each of said electrical conductors at predetermined locations;

said camming member including second contact means for electrically contacting one of said spaced, electrical conductors when said pivot member is rotated in one direction and the other of said conductors when said pivot member is rotated in the opposite direction; and

third contact means for electrically connecting said second contact means on said camming member to said electrically operated means whereby separate and distinct electrical circuits are provided through said camming member and pivot member for actuating rotation of said pivot member in a selected direction depending on the rotational position of said pivot member.

4,142,168

SWITCH CONSTRUCTION

James P. Natland, 333 Weymouth Pl., Laguna Beach, Calif. 92651

Filed Jun. 2, 1977, Ser. No. 802,720
Int. Cl.[2] H01H *36/00*
U.S. Cl. 335—207 **7 Claims**

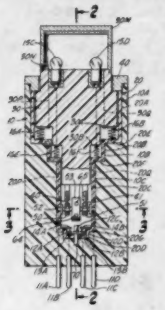
1. An electrical switch comprising:

a plurality of stationary switch contacts and a movable switch element associated therewith, a first permanent magnet affixed to said switch element for moving said element relative to said switch contacts;

a plurality of second magnets, support means for carrying said second magnets whereby the poles thereof are positioned in alternating, spaced relationship;

indexing means cooperating with said support means for

indexing successively alternating poles of said second magnets adjacent a pole of said first magnet to selectively



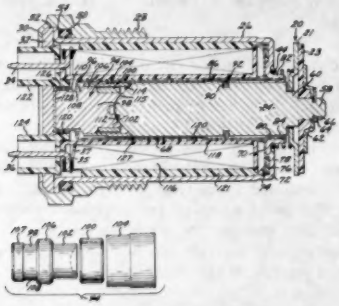
attract and repel said first magnet to actuate said switch element.

4,142,169

SOLENOID AND METHOD OF MANUFACTURE

Jay R. Katchka, Cypress, and Samuel T. Kelly, Torrance, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 18, 1977, Ser. No. 816,656
Int. Cl.[2] H01F *7/10*
U.S. Cl. 335—243 **6 Claims**



1. A pole piece and retainer sleeve assembly for a solenoid comprising:

(a) a cylindrical sleeve for mounting within a coil of a solenoid assembly;

(b) a stationary pole assembly received therein comprising

(1) a pole piece having an arcuately concave end and a central, raised annular rim;

(2) a shading ring distally carried thereon;

(3) a flux ring press-fitted on said central raised annular rim and projecting past said concave end to a precise axial position thereon; and

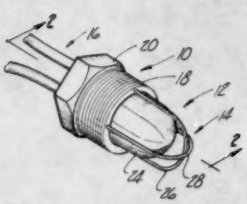
(c) a moveable armature slidably received within said cylindrical sleeve and having an arcuately convex end opposed to said arcuately concave end of said pole piece and having a greater radius of curvature to mate therewith in a circular line contact about its periphery and at a precise axial spaced-apart position from said flux ring.

4,142,170

HIGH RESPONSE TEMPERATURE SENSOR

Albert Blatter, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 5, 1977, Ser. No. 857,557
Int. Cl.[2] H01C *7/00*
U.S. Cl. 338—28 **7 Claims**



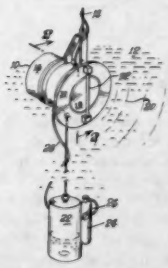
1. A temperature sensor for sensing the temperature of a fluid comprising a base member formed of molded material, fin means formed in a thin sheet in a generally hemispherical dome-like shape having a high surface area to mass ratio, said fin means being fixedly mounted on said base member in sealing engagement therewith and forming a cavity within the interior of the dome formed by said fin means, the fluid being sensed flowing over the outer surface of said fin means and being precluded from entering said cavity, semiconductor means mounted on said fin means within said cavity and having a characteristic which varies with changes in temperature, a first output conductor at least partially molded in said base member and connected to said fin means, a second output conductor electrically insulated from said fin means and connected to a surface of said semiconductor means, and cage means supported spaced from the exterior surface of said fin means in partial, surrounding relation thereto, said cage means being formed from a plurality of wires having a generally U-shape with said wires being joined at the apex of the wires.

4,142,171

EFFICIENT APPARATUS FOR PROJECTING ACOUSTIC WAVES

George O. Pickens, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1977, Ser. No. 758,108
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—12 R **14 Claims**



1. Apparatus for projecting acoustic waves in liquid media, said apparatus comprising:

a chamber which is adapted to be immersed in said liquid media for retaining a gaseous material to provide a selected compliance, said chamber having an aperture;

a piston of selected mass sealably mounted in said aperture with one end adapted to displace a selected mass of said

liquid media and the other end adapted to cyclically compress and expand said gaseous material;

actuating means coupled to said piston for reciprocating said piston at the resonant frequency of a mechanical system substantially comprising said compliance, the mass of said piston, and the mass of said displaced liquid media; and

volume regulating means for determining the volume within which said gaseous material is enclosed when said piston is at a specified position during one of said reciprocations; and

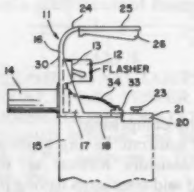
pressure regulating means for maintaining a selected relationship between the pressure within said chamber and the pressure of said media adjacent to said apparatus.

4,142,172

EMERGENCY POWER PACK FOR VEHICLE TRAILER LIGHTS

Roger Menard, 11 Pauline Dr., Clearfield, Pa. 16830

Filed Jun. 15, 1976, Ser. No. 696,267
Int. Cl.[2] B60Q *1/00, 1/46*
U.S. Cl. 340—81 R **3 Claims**



1. An emergency power pack for a vehicle trailer lighting system having male plugs for connection to mating plugs on a tractor, said pack being portable and adapted to be connected to an abandoned vehicle trailer for the purpose of flashing the trailer lights on and off while the trailer is left unattended in order to warn passing motorists, the device comprising, in combination:

a mounting plate comprising a material with electrical conductance properties and consisting of a front wall integrally formed on each of its side edges with angularly disposed side walls and joined to the outside edges of two bottom walls which are substantially rectangular in shape and parallel to each other and extending rearwardly from said front wall to leave an opening therebetween, said bottom walls each having along their outside and rearward edges a U-shaped bracket to form an open slot and provided with a round threaded through hole for receiving a threaded bolt, said front wall of said mounting plate having a curved top end to which is integrally joined a handle disposed centrally along the length of the top surface, said handle being reinforced by means of an affixed semi-circular member to provide a hand grip, said front wall having round through holes for connection of components thereto;

a flasher unit connected to the rear surface of said front wall, an on-off switch connected to the rear surface of said front wall, and adapter plug attached to the front surface of said front wall, said adapter plug having a plurality of round female plugs designed to mate with said male plugs provided on said vehicle trailer; and

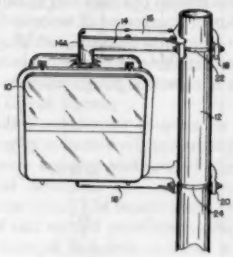
a conventional battery electrically connected to said flasher unit and said on-off switch and which is rectangular and has an electrically conductive outside metal surface with flanges along the top edge of two of its sides, said flanges being connected to said U-shaped brackets provided in said bottom walls to provide a mechanical and electrical ground connection thereto.

4,142,173

MOUNTING BRACKET ASSEMBLY FOR TRAFFIC SIGNALS AND PEDESTRIAN SIGNAL UNITS

James S. Gould, Los Alamitos, and Samuel Gould, San Pedro, both of Calif., assignors to Indicator Controls Corporation, Gardena, Calif.

Filed Feb. 7, 1977, Ser. No. 766,612
Int. Cl.[2] E01F *9/01*; F21S *1/10*; F16L *43/00*
U.S. Cl. 340—119 **8 Claims**



1. In combination: an upright pole; a rectangular-shaped pedestrian traffic signal unit having a mounting hole in an edge thereof; an elongated mounting bracket having a tubular protuberance at one end thereof extending perpendicularly to the longitudinal axis of the bracket and into said mounting hole to mount the signal unit to the bracket, said bracket having an opening therein at the other end thereof for receiving electric wires from the interior of the pole, and said bracket defining a housing; means mounting the bracket on the pole to extend radially outwardly thereform and with said opening therein adjacent to a hole in the pole; and a terminal strip mounted in the housing defined by the bracket and connected to the wires extending from the interior of the pole into the housing through said opening therein and through the hole in the pole, and said terminal strip being connected to wires extending through said protuberance and through said mounting hole into the unit and connected to electrically energized illuminating elements therein.

4,142,174

HIGH SPEED DECODING OF REED-SOLOMON CODES

Chin L. Chen, Wappingers Falls, and Mu Y. Hsiao, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,763
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AL **9 Claims**

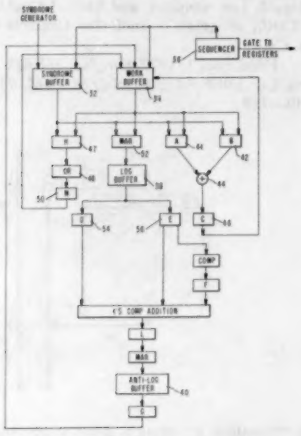
1. In a decoder for an error detection and correction system using a Reed-Solomon code for detection and correcting a plurality of errors in codewords made up of k data and n-k check symbols each symbol made up of m binary bits of information so that the error location polynomial $\sigma(x) = x^e + \sigma_1 x^{e-1} + \ldots \sigma_e$ where e is the number of errors and the coefficients of $\sigma(x)$ are related to the error syndromes S_i generated by the decoder by the equation

$S_{i+e} + \sigma_1 S_{1+e-1} + \ldots + \sigma_{e-1} + \sigma_e S_i = 0$ where the syndromes are field elements α^j of $GF(2^m)$ an improved error correction and polynomial calculator for determining the number of errors in the codewords after the decoder determines that at least one error exists comprising,

means for determining if $S_0 \neq 0$,

means for setting $\sigma = S_1/S_0$ when $S_0 \neq 0$,

means for determining if $S_2 + \sigma S_1 = 0$ and $S_3 + \sigma S_2 = 0$ when $\sigma = S_1/S_0$ and,



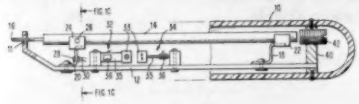
means for providing an indication that one symbol error has occurred when $S_2 + \sigma S_1 = 0$ and $S_3 + \sigma S_2 = 0$ with $\sigma = S_1/S_0$.

4,142,175

PRESSURE SENSING DEVICE AND TRANSDUCER ARRANGEMENT

Noel M. Herbst, Mount Kisco; Chao N. Liu, Yorktown Heights, and Hugo A. Panissidi, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,651
Int. Cl.[2] G01L 5/16
U.S. Cl. 340—146.3 SY **9 Claims**



1. A pressure sensing probe for producing a continuous pressure dependent signal as the probe is moved into contact with a surface, said probe comprising,

an elongated flexible pressure sensing element having a surface engaging tip at one end thereof,

a substantially rigid support means for carrying said pressure sensing element,

first and second flexible mounting means for attaching said pressure sensing element to said rigid support member at opposite ends thereof,

means for rigidly attaching the first mounting means to both the pressure sensing element and support member, means for rigidly attaching one end of the second mounting means to said support member and pivotally attaching said second mounting means to said pressure sensing element,

the relative stiffness of said mounting means being such that the majority of flexure occurs in the second of said mounting means whenever the distance between same decrease due to flexure of said flexible pressure sensing element when a transverse force is applied to same,

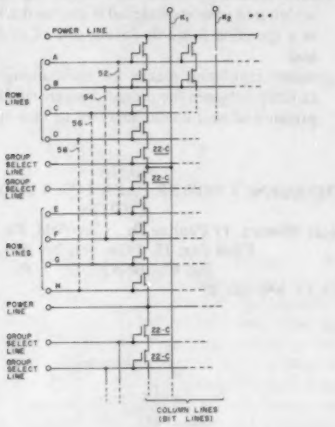
signal producing means located on said second mounting means having the greater flexibility for producing an electrical signal proportional to the degree of deflection of said mounting means.

4,142,176

SERIES READ ONLY MEMORY STRUCTURE

Harold W. Dozier, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Sep. 27, 1976, Ser. No. 726,579
Int. Cl.[2] G11C 7/00
U.S. Cl. 340—166 R **10 Claims**



1. A logic structure comprising:

A semiconductor substrate having a plurality of groups of field affect transistors formed at selected locations thereon, each of said transistors having portions defining a gate, a source, and a drain;

each group of transistors being arrayed in a set of input rows and a set of output columns;

the gates of the transistors in each output row being formed in common;

the drains of transistors within each output column being connected in series electrical relation to the sources of adjacent transistors in each output column, whereby a gate controlled, series conduction path is established through each output column of transistors in each group;

means for electrically connecting each corresponding input row of each group to form common input lines; and,

means for selectively coupling corresponding output columns of each group to a common output line, said coupling means being responsive to a bias potential which corresponds to a selected logic state to electrically connect or disconnect its associated output column to or from the common output line.

4,142,177

DIGITAL TONE DECODER SYSTEM

Walter L. Davis, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1976, Ser. No. 713,746
Int. Cl.[2] H04Q 9/00; H04M 1/50, 11/02; G01R 23/02
U.S. Cl. 340—171 R **25 Claims**

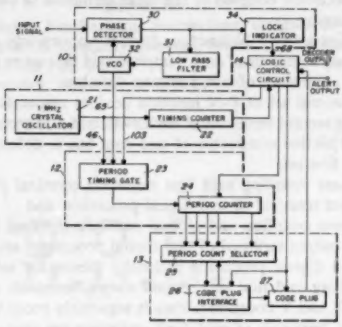
1. A digital decoder for producing an output in response to an input signal wave of a predetermined frequency, which may be one of a plurality of signal waves having different frequencies, including in combination,

reference means for providing clock pulses of a fixed frequency, which is substantially greater than said predetermined frequency,

period counter means for producing outputs in response to different numbers of pulses applied thereto to measure the periods of the cycles of the input signal wave,

gate means for applying clock pulses from said reference means to said period counter means, said gate means including enabling means having an input for receiving

the input signal wave, said enabling means being responsive to a particular part of the cycle of the signal wave to enable said gate means to pass clock pulses during a predetermined portion of the input signal wave, and



address code means coupled to said period counter means and responsive to the outputs therefrom for indicating a signal wave of a predetermined frequency.

4,142,178

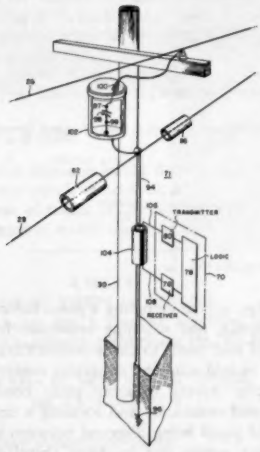
HIGH VOLTAGE SIGNAL COUPLER FOR A DISTRIBUTION NETWORK POWER LINE CARRIER COMMUNICATION SYSTEM

Ian A. Whyte, Churchill Borough, and Stephen R. Swanson, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1977, Ser. No. 790,228

Int. Cl.[2] H04B 3/56

U.S. Cl. 340—310 R **5 Claims**



5. A signal coupler for coupling carrier communication signals at a first frequency between an electrical distribution network having at least first and second primary conductors whereon power current is transmitted at a second frequency and a communication element, comprising:

a plurality of ground conductors each connected to real earth ground and to said second primary conductor of said distribution network;

a capacitive element having first and second terminals disposed in a housing; said first terminal being electrically insulated from said housing and connected to said first primary conductor; said second terminal being connected to said housing and to one of said ground conductors; said capacitive element having a value which exhibits a low impedance at said first frequency of said carrier signals and a high impedance at said second frequency of said power current;

a first transformer coupler having primary and secondary portions; said primary portion including a hollow core of magnetic material disposed in inductive relation around said ground conductor associated with said capacitive element whereby a single turn primary winding a formed; said secondary portion including wound conductors inductively coupled to said core and further coupled to said communication element in impedance matched relation; said core being further disposed in parallel relation with an impedance element having a predetermined value such that a parallel resonant circuit is formed at said first frequency of said carrier signals;

a plurality of second transformer couplers, at least one of which is disposed in inductive relation around said second primary conductor between said ground conductor associated with said capacitive element and each adjacent ground conductor connected to said second primary conductor; each of said second transformer couplers including a hollow core of magnetic material cooperatively arranged in parallel with an impedance element having a predetermined value such that a parallel resonant circuit is formed at said first frequency.

4,142,179

SAFETY WARNING LAMPS FOR ADVERSE OR HAZARDOUS ATMOSPHERES

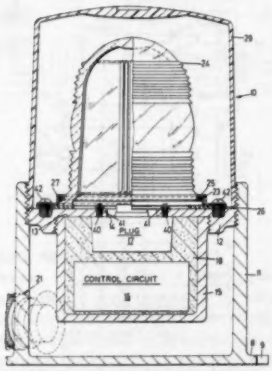
Roy B. W. Lowndes, 79 Hollie Lucas Rd., Kings Heath, Birmingham, England

Continuation of Ser. No. 512,161, Oct. 4, 1974, abandoned. This application Jun. 10, 1976, Ser. No. 694,814

Claims priority, application United Kingdom, Oct. 5, 1973, 46068/73

Int. Cl.[2] G08B 5/00

U.S. Cl. 340—321 **2 Claims**



1. A warning lamp for use in hazardous atmospheres comprising

a hollow base member having an open end,

a plate member connected to the base member across the open end thereof, said plate member having a centrally-disposed aperture therethrough, being circular, and having peripheral surfaces with a first screw threaded portion and a second screw threaded portion,

a hollow housing having an open end and having a screw threaded portion adjacent its open end engaging said first screw threaded portion of said plate member within the hollow base member and defining a first air filled volume between the housing and the base member.

a plug for receiving a light-emitting, said plug being mounted within said hollow housing and projecting into the aperture in the plate member,

a light-emitting element in the form of a xenon gas-discharge lamp secured to said plug and projecting to the other side of the plate member from said hollow housing,

a transparent light-magnification dome mounted on said plate member and surrounding said gas-discharge lamp to define a second air filled volume between the lamp and the dome,

a generally cylindrical transparent protective dome formed of polycarbonate and surrounding the light focusing dome to define a third air filled volume between the magnification dome and the protective dome,

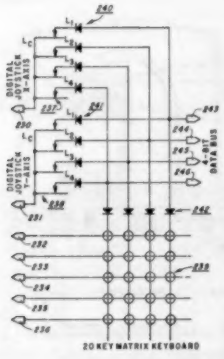
electrical control means encapsulated in a potting compound within said hollow housing and connected to said plug to cause said light-emitting element to flash intermittently, said protective dome having a screw threaded portion on its outer surface adjacent its open end, and the hollow base member being cylindrical and having a screw-threaded portion on its inner surface adjacent its opening end engaging the screw-threads of the second screw threaded portion on said peripheral surface of the circular plate member and the screw-threads on said protective dome, said screw-threads forming a passageway for escaping hot gases wherein a temperature reduction occurs, whereby in the event of an explosion each of said volumes stores a quantity of explosive gases prior to permitting escape thereof along said passageway.

4,142,180

DIGITAL JOYSTICK CONTROL INTERFACE SYSTEM FOR VIDEO GAMES AND THE LIKE

David C. Burson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1977, Ser. No. 785,145
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—709 **8 Claims**



1. A digital joystick control interface system comprising:

(a) at least one digital joystick control having a shaft member which is moveable in any direction in an X-Y plane to selected points in said plane, said joystick control including:

(i) first and second sets of switch means controlled by said shaft member, said first set of switch means for generating a digital-coded signal representative of the X coordinate of said shaft member in said X-Y plane, and said second set of switches for generating a digital-coded signal representative of the Y coordinate of said shaft member in said X-Y plane,

(ii) means coupling one terminal of each switch in said first set to a first common terminal, and

(iii) means coupling a second terminal of each switch in said second set to a second common terminal;

(b) a digital processor having a plurality of input terminals and a plurality of output terminals;

(c) a common data bus having a plurality of conductors respectively coupled to the input terminals of said digital processor;

(d) a first set of P-N junction devices respectively coupling second terminals of each switch in said first set to a respective conductor of said common data bus;

(e) a second set of P-N junction devices respectively coupling second terminals of each switch in said second set to a respective conductor of said data bus in common with said first set;

(f) means coupling said first common terminal to a first output terminal of said digital processor; and

(g) means coupling said second common terminal to a second output terminal of said digital processor; and

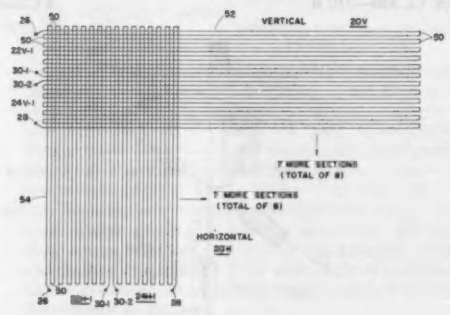
(h) said digital processor including means for selectively strobing said first and second output terminals whereby the X and Y coordinate data is separately received at the input terminals of said digit processor via said common data bus.

4,142,181

SCANNING SYSTEM AND METHOD USING COINCIDENCE OF VARIABLE FREQUENCY PULSES

Anthony C. Moricca, 3629 Aboite Lake Rd., Fort Wayne, Ind. 46804, and Dwight S. Humphreys, Fort Wayne, Ind., assignors to Anthony C. Moricca, Fort Wayne, Ind.

Filed Apr. 22, 1977, Ser. No. 789,985
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—781 **39 Claims**



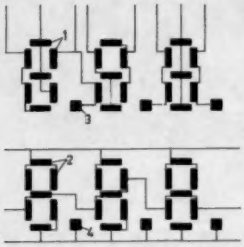
1. In a display system including a panel having electroluminescent properties, and scanning apparatus for exciting selected areas of said panel to cause luminescence thereof, the improvement in said scanning apparatus comprising: an elongated conductor having opposite ends; conductive means spaced from said conductor and forming a transmission line therewith, said panel being disposed between said conductor and conductive means and insulated therefrom; means for generating a train of variable rate, narrow signal pulses; means coupling said generating means to one end of said line for applying said narrow pulses thereto whereby said pulses are propagated along said line toward the other end thereof, said other end of said line being adapted to reflect non-inverted pulses back toward said one end; means for varying the repetition rate of said pulses between f and 2f where f is such that a reflected pulse and the next successive applied pulse coincide at said one line end whereby the points of coincidence of said reflected and applied pulses are moved between said one line end and a point midway between said ends, the amplitudes of said reflected and applied pulses adding at said coincidence

points thereby exciting areas of said panel between said conductor and conductive means.

4,142,182
PROCEDURE FOR ADDRESSING OF VISUAL DISPLAY DEVICES

Allan R. Kmetz, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 16, 1977, Ser. No. 769,322
Claims priority, application Switzerland, Feb. 25, 1976, 2286/76
Int. Cl.² G09F *9/32*
U.S. Cl. 340—765 **2 Claims**



1. A method for the addressing of visual display devices comprising stylized alphanumeric characters which consist of similarly shaped front and rear display elements, whereby in the case of simultaneous selection of a front and the corresponding rear display elements an optical activation of these elements results such that by coincident selection of the front and rear display elements of several pairs of elements having a specific geometrical configuration a corresponding alphanumeric character becomes visible, comprising the steps of:

interconnecting the display elements as a matrix to reduce the number of address leads and drivers;

extending the address leads in one matrix dimension over more than one character;

interconnecting display elements which belong to more than one character by address lines in a second matrix dimension;

time-sharing the address leads through multplexed operation;

selecting the front elements of the display with the address leads in the one matrix dimension; and

selecting the rear elements of the display with the address leads in the second matrix dimension.

4,142,183
DRAW/DISPLAY MEANS

Clarence F. Castleberry, Rte. 2, Box 481, Brighton, Tenn. 38011, and Michael F. Castleberry, 6678 Norde Dr., S., Jacksonville, Fla. 32210

Filed May 16, 1977, Ser. No. 797,356
Int. Cl.² G08B *5/36*
U.S. Cl. 340—706 **4 Claims**

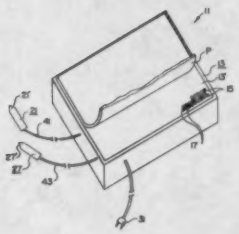
1. A draw/display means comprising:

(a) a board means having an exterior face;

(b) a plurality of electrically conductive contact means, each of said contact means being ring-shaped and being mounted on said face of said board means;

(c) a plurality of light means mounted on said face of said board means adjacent one of said contact means and being electrically coupled to said adjacent contact means, each of said light means being positioned within one of said ring-shaped contact means;

(d) a plurality of electrical responsive means for activating said light means in response to an electrical pulse being received by said contact means, each of said electrical responsive means being electrically coupled to one of said contact means and to said light means that is adjacent said one of said contact means for causing said adjacent light means to be activated when an electric pulse is received by said one of said contact means; and

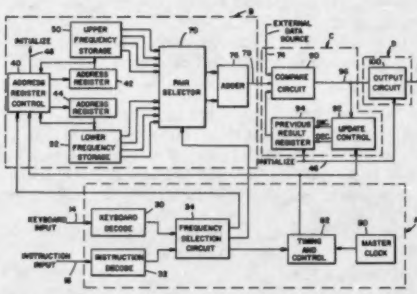


(e) a first electric probe means for selectively applying electrical pulses to selective ones of said contact means to activate selective ones of said light means.

4,142,184
DIGITAL MULTITONE GENERATOR FOR TELEPHONE DIALING

Don W. Lake, Cupertino, Calif., assignor to Comdial Corporation, San Francisco, Calif.

Continuation of Ser. No. 587,453, Jun. 16, 1975, Pat. No. 4,058,805. This application May 9, 1977, Ser. No. 795,048
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.² H03K *13/02*; H04B *1/00*
U.S. Cl. 340—347 DA **2 Claims**



1. A digital delta modulator comprising:

comparator means for generating a digital pulse train in response to a series of comparisons of the value of a first multi-bit data word representing the amplitude of an analog waveform at a particular sample time and the value of a second multi-bit data word representing an approximation of the amplitude of said waveform at an immediately preceding sample time;

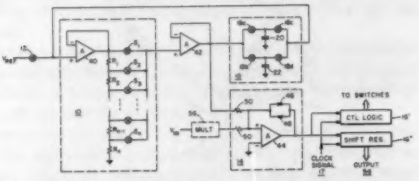
data source means for supplying said first data words to one input of said comparator; and

memory means responsive to the output of said comparator for generating said second data word therefrom and providing said data word to another input of said comparator, said memory means including binary counting means responsive to said digital pulse train for incrementing or decrementing the contents thereof to cause generation of said second data word, whereby said digital pulse train reflects the time sequential change in value between successive ones of said first data words.

4,142,185
LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Bernard M. Gordon, Magnolia, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Sep. 23, 1977, Ser. No. 836,160
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD 14 Claims



1. A method for providing a binary logarithmic representation of the ratio of an input signal and a reference signal, comprising the step of:

first electronically selecting the reference signal;

second, performing a series of cycles, each including the following steps:

multiplying the selected signal by a predetermined factor to produce an intermediate signal;

comparing the intermediate signal with the input signal to provide a binary output signal representative of which of the two signals is larger;

storing the value of the intermediate signal and selecting the stored value in place of the previously selected signal only when the output signal provided during the present cycle indicates that the input signal exceeds the intermediate signal;

reducing the predetermined factor by dividing by $A.B^{(n-x)}$, where A and B are constants, x is the number of cycles to be performed, and n is the number of the current cycle, to provide a new predetermined factor; and then

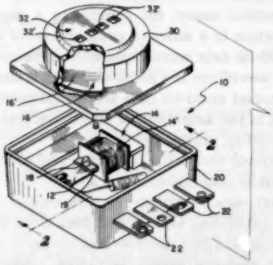
returning to the second step to perform a new cycle, unless and until n equals x;

the binary output signals produced during the series of cycles providing the logarithmic representation.

4,142,186
MEANS FOR IMPROVING THE ELECTROACOUSTICAL PROPERTIES OF A BUZZER

Louis P. Sweany, Carmel, and Michael T. Burk, Indianapolis, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 1, 1977, Ser. No. 820,551
Int. Cl.[2] G01K *9/12*
U.S. Cl. 340—388 10 Claims

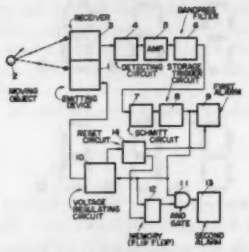


1. In an electromechanical vibrating device for producing an audible signal, the improvement which comprises: means for attenuating undesirable frequencies of said audible signal wherein said attenuating means includes a circular planar vibration diaphragm comprised of a plastic polymer material, a vibrating striking member positioned to strike said vibration diaphragm at its center, and a conical bumper comprised of resiliant material interposed between said vibrating striking member and said vibration diaphragm.

4,142,187
DUAL FREQUENCY ALARM DEVICE USING DOPPLER EFFECT FOR SENSING A MOVING OBJECT

Hiroshi Nakayama, Machida, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,732
Claims priority, application Japan, Mar. 19, 1976, 51-32235[U]
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—554 10 Claims



1. An alarm device comprising:

a monitor wave emitting device for selectively emitting electrical or supersonic monitor waves of at least two predetermined frequencies, said monitor wave emitting device comprising an oscillating circuit having a resonator including variable capacitance diode means for changing the frequency of the monitor wave to be emitted from a first frequency to a second frequency, reverse bias voltage means coupled to said diode means, and means for emitting the output of said oscillating circuit as monitor waves into the monitored area;

a receiver for receiving the reflected waves from a moving object intruding into the monitored area within a given moving velocity range, said receiver comprising receiving means for receiving said reflected waves, said receiving means being more matched to said first frequency monitor wave than to said second frequency monitor wave;

a detecting circuit coupled to said receiver for detecting the frequency deviation of the received reflected waves for obtaining a Doppler signal;

signal processing circuit means coupled to said detecting circuit for storing, for a predetermined time, signal components of the Doppler signal of the frequency range corresponding to the velocity range when said Doppler signal components have greater than a predetermined amplitude and for generating first and second pulse outputs when the amplitudes of the stored Doppler signal components exceed a predetermined value;

first alarm means coupled to said signal processing circuit and activated by said pulse output thereof;

a voltage regulating circuit coupled to said signal processing circuit and to said emitting device for receiving the first pulse output for changing the reverse bias voltage to the variable capacitance diode means for a predetermined time in order to change the emitted monitor wave frequency;

an alarm signal issuing circuit coupled to said signal processing circuit for generating an output signal when the second pulse output resulting from the reflected monitor wave with the frequency subsequent to the frequency change is generated within a predetermined time following the first pulse output resulting from the reflected monitor wave with the frequency prior to the change; and

second alarm means coupled to said alarm signal issuing

circuit for generating an alarm responsive to the output signal of said alarm signal issuing circuit.

4,142,188

METHOD AND APPARATUS FOR MONITORING SOUND-CONDUCTING MEDIA

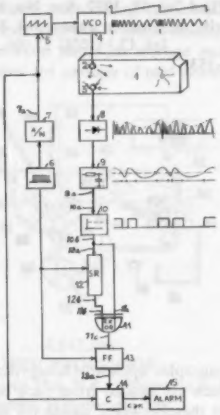
Alois Zetting, Herrliberg, and Markus Köpfli, Wil-St. Gallen both of Switzerland, assignors to Cerberus AG, 8708 Männedorf, Switzerland

Filed Nov. 19, 1976, Ser. No. 743,392

Claims priority, application Switzerland, Dec. 8, 1975, 15848/75; Sep. 29, 1976, 12296/76

Int. Cl.[2] G08B *13/22*

U.S. Cl. 340—558 **21 Claims**



1. A method of monitoring sound-conducting media, comprising the steps of:

providing at least one sound-conducting medium;

transmitting sound vibrations to the sound-conducting medium;

controlling the frequency of the transmitted sound vibrations so as to periodically pass through a predetermined frequency range during successive frequency throughpass periods;

receiving a resonance spectrum of the sound vibrations at the sound-conducting medium excited during said frequency throughpass periods;

comparing the amplitude course or phase course of the received resonance spectrum of the sound vibrations during a given evaluation period with the amplitude course or phase course during another evaluation period which precedes said given evaluation period; and

triggering an alarm when there are present deviations of both amplitude courses or both phase courses from one another.

4,142,189

RADAR SYSTEM

Joseph P. Gleason, Woodland Hills, Calif., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Jan. 7, 1965, Ser. No. 424,464

Int. Cl.[2] G01S *9/233*

U.S. Cl. 343—9 **3 Claims**

1. A radar system for determining the range to and velocity of a target comprising the combination of:

transmitting means for radiating energy at a first particular frequency toward the target,

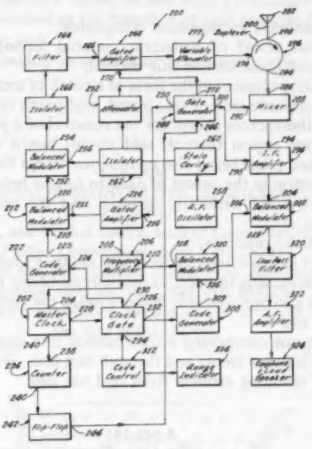
encoding means for generating a series of binary encoding pulses having a repetitive pseudo-random pattern, said series including a plurality of groups each of which include the same number of pulses wherein the plurality constitutes an odd number,

means for operatively interconnecting said encoding means with said transmitting means for modulating the transmitted energy in response to said binary encoding pulses to thereby provide a modulation pattern on said energy,

gating means operatively interconnected with said transmitting means for periodically gating said transmitting means "ON" and "OFF" at a particular time in successive groups of the binary encoding pulses,

means operatively interconnected with said gating means to count said binary encoding pulses for actuating said gating means at the particular time in the successive groups so that said gating means will cause said transmitting means to radiate pulses of energy that have their modulation patterns repeat in accordance with the repetition rate of said series of encoding pulses,

receiving means operative during the intervals between the radiation of said pulses for receiving the energy reflected from the target to provide reflected energy having frequencies that differ from the frequency of the transmitted energy in accordance with the velocity of the target relative to the transmitting means and having modulation patterns substantially identical to but delayed from the transmission pattern in accordance with the range to the target,



means operatively interconnected with said first encoding means for producing a second series of binary encoding pulses according to said predetermined code and having said pseudo-random pattern,

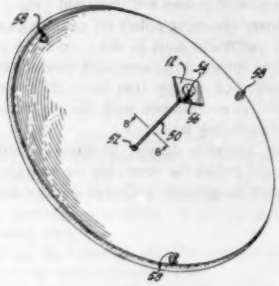
means operatively interconnecting said last means with said receiving means for supplying said second series of binary encoding pulses to said receiving means with a time delay substantially equal to the time required for the radiated energy to return from the target, and

means for comparing said delayed series with the modulation pattern on the reflected signals from the target to provide an output signal having a frequency corresponding to the difference between the frequency of the transmitted energy and the frequency of the energy received from the target.

4,142,190
MICROSTRIP FEED WITH REDUCED APERTURE BLOCKAGE

John L. Kerr, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1977, Ser. No. 838,044
Int. Cl.[2] H01Q 1/38, 19/12
U.S. Cl. 343—700 MS 8 Claims



1. An antenna arrangement comprising:

a circuit board of dielectric material having a metallic ground plane on one side thereof;

a radiating element in the form of a patch of metal etched on the opposite side of said board, said patch being continuous thereacross except for the removal of a portion in the central region thereof; said circuit board and metallic ground plane being also continuous except for removal of a portion in the center of each to form a hole completely through the dielectric material and the metal on both sides;

a parabolic reflector;

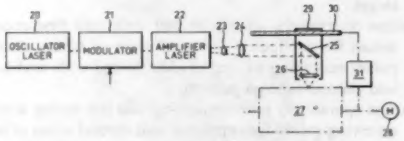
support means extending from said parabolic reflector, along the focal axis thereof, to said circuit board to support it, with said opposite side facing toward the parabolic reflector; and

feed means comprising a transmission line extending along said support means and through said hole, and coupled to said radiating element from said one side.

4,142,191
LASER APPARATUS

Brooke A. Ward, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 23, 1977, Ser. No. 827,184
Claims priority, application United Kingdom, Aug. 24, 1976, 35222/76
Int. Cl.[2] G01D 15/10; H01S 3/23
U.S. Cl. 346—76 L 6 Claims

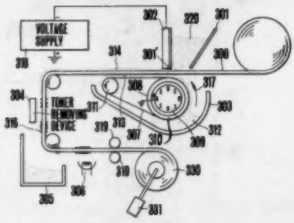


1. Scanning image-reproduction apparatus, comprising: a laser oscillator, a modulator positioned to modulate an output light beam from the laser oscillator, a laser amplifier positioned to receive the modulated laser beam, and means for scanning an output light beam from the amplifier over the surface of a record medium, the laser amplifier comprising a plurality of laser sections optically arranged in series, means for passing a polarised light beam to be amplified into the plural section laser amplifier at an entry point in an intermediate section thereof and directing the light beam towards a first end of the laser amplifier, means for redirecting the polarised light beam back through the laser amplifier from said first end to an exit window at the other end of the amplifier, and means for rotating the plane of polarisation of the light beam through 90° to prevent its emergence at the original entry point, whereby the light beam obtained from the exit window has passed twice through the initial stages of the laser amplifier.

4,142,192
ELECTROGRAPHIC PROCESS AND APPARATUS WITH RECORDING AFTER TONING

Hiroshi Ochi, Kodaira, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jul. 15, 1977, Ser. No. 816,059
Claims priority, application Japan, Jul. 16, 1976, 51-84566
Int. Cl.[2] G03G 15/06
U.S. Cl. 346—153 15 Claims

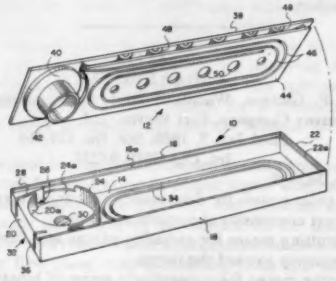


1. An electrographic apparatus comprising a pair of opposed electrodes which are spaced from each other to define a recording region therebetween, means for applying a relatively low signal voltage across said pair of electrodes, means for feeding a recording medium through said recording region, toner supply means for continuously supplying an electroconductive toner between one of the electrodes and one surface of said recording medium, means for continuously supplying electroconductive powder particles between the other electrode and the other surface of said recording medium, means for removing surplus toner and electroconductive material from the surfaces of said recording medium after it has passed through said recording region thereby forming a toner image, and means for fixing said toner image.

4,142,193
FILM STORAGE AND DEVELOPING CASSETTE

Hubert J. Otte, 165 Evelyn Ave., and Gosta Roosman, 98 Merrick St., both of Toronto, Ontario, Canada

Filed May 10, 1977, Ser. No. 795,631
Int. Cl.[2] G03D 3/16
U.S. Cl. 354—313 7 Claims



1. A film storage and developing cassette for storing raw

unexposed photographic film, and for permitting the same to be exposed and subsequently developed therein, said cassette comprising;

an integral housing structure having film storage means, and developer chamber means therein;

film passageway means for passage of said film from said film storage means for exposure thereof and subsequently to be returned to said developer chamber means;

film guide means in said developer chamber for guiding said film entering said chamber along a predetermined path whereby to arrange said film in lengths, spaced apart from one another;

liquid circulation passageway means in said chamber for permitting liquid therein to circulate between respective said lengths of film in said chamber:

normally closed access port means, for introducing developer chemicals into said film storage means, and,

opening means between said film storage means and said developer chamber for passage of said chemicals therein.

4,142,194

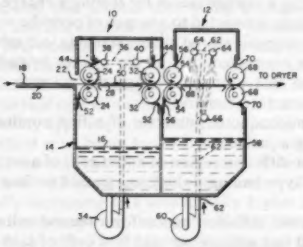
WEB PROCESSOR

James S. Hamlin, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 656,358, Feb. 9, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,477

Int. Cl.[2] G03D *5/00*

U.S. Cl. 354—318 **6 Claims**



1. Apparatus having first and second contiguous sections for processing a photosensitive layer on a substrate comprising, in combination,

drive means for moving said substrate through said sections, layer side up, said drive means including nip roll pairs at the entrance and exit of each processing section,

first and second fluid supply means for applying substantially uniform curtains of a fluid processing material to said layer at the entrance and exit of said first section for establishing and maintaining a uniform pool of said fluid processing material across said layer from said entrance to said exit, and

rinse means in said second section for rinsing said layer,

each of said fluid supply means including a barrier means extending longitudinally of the upper roll in each pair within said first section for preventing the escape of processing material.

4,142,195

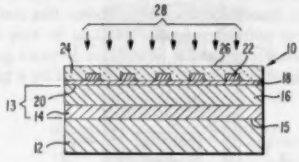
SCHOTTKY BARRIER SEMICONDUCTOR DEVICE AND METHOD OF MAKING SAME

David E. Carlson, Yardley, Pa.; Christopher R. Wronski, Princeton, and Alfred R. Triano, Jr., Scotch Plains, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 668,908, Mar. 22, 1976, abandoned. This application Jul. 30, 1976, Ser. No. 710,186

Int. Cl.[2] H01L *29/48, 31/00*

U.S. Cl. 357—15 **37 Claims**



1. A Schottky barrier semiconductor device comprising:

an annealed body of amorphous silicon fabricated by a glow discharge in silane, SiH_4;

a metallic film on a surface of said body providing a surface barrier junction at the interface of said metallic film and said body; and

means for making an ohmic contact to said body.

4,142,196

POLYCHROMATIC MONOLITHIC SEMICONDUCTOR ASSEMBLY

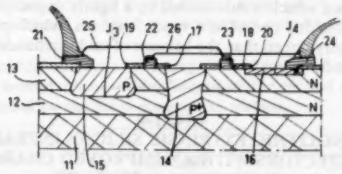
Daniel Diguet, and Michel Gaffre, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 701,656, Jul. 1, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,650

Claims priority, application France, Jul. 8, 1975, 75 21402

Int. Cl.[2] H01L *33/00*

U.S. Cl. 357—17 **8 Claims**



1. A polychromatic semiconductor assembly, comprising and formed by:

(a) a semiconducting substrate,

(b) at least two semiconductor epitaxial layers superimposed on said substrate, said layers having respective forbidden bandwidths that decrease in the direction from the uppermost to the lowest said layer, the overmost said layer comprising a surface, wherein said layers consist essentially of III-V compound of n-type conductivity and said diffused regions are of p type

(c) plural electroluminescent diodes emitting radiation in different wavelength ranges and comprising diffused regions that are of different compositions, said regions being located at respective areas of said surface situated near each other and localized at said surface, said regions extending down to the interior of different respective said epitaxial layers and forming diode junctions therewith.

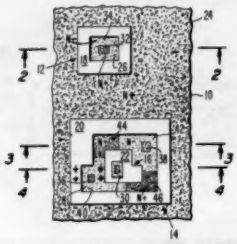
4,142,197
DRAIN EXTENSIONS FOR CLOSED COS/MOS LOGIC DEVICES

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corp., New York, N.Y.

Continuation-in-part of Ser. No. 787,700, Apr.4, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 892,906

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **9 Claims**



1. An improved intergrated circuit comprising at least one closed geometry IGFET of the type comprising:
(a) a semiconductor substrate region of a first conductivity type;
(b) a pair of spaced regions having a conductivity type opposite that of said substrate region and extending into said substrate region wherein one of said spaced regions completely surrounds the other one of said spaced regions, the surrounding region being the source of said IGFET and the surrounded region being the drain of said IGFET;
(c) a gate insulating layer on the surface of said substrate region extending over said substrate region between said pair of spaced regions; and
(d) a conductive gate region overlying said gate insulating layer,
wherein the improvement comprises a highly doped ohmic contact region of the same conductivity type as said spaced regions which highly doped ohmic contact region is more highly doped than the surrounded one of said spaced regions and which is formed within the surrounded one of said spaced regions and which is surrounded by a lightly doped portion of said surrounded one of said spaced regions, which portion is more lightly doped than the balance of said surrounded one of said spaced regions.

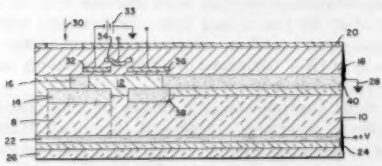
4,142,198
MONOLITHIC EXTRINSIC SILICON INFRARED DETECTORS WITH AN IMPROVED CHARGE COLLECTION STRUCTURE

Ronald M. Finnila, Costa Mesa, and Stephen C. Su, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 6, 1976, Ser. No. 702,548

Int. Cl.[2] H01L *29/78, 27/14, 31/00;* G11C *19/28*

U.S. Cl. 357—24 **29 Claims**



1. An image detector including in combination:
(a) a semiconductor substrate of a first conductivity type;
(b) a continuous epitaxial layer adjacent to said semiconductor substrate of a second type conductivity;
(c) an optical detector region formed in at least a portion of said semiconductor substrate which is extrinsically doped for generating charge in response to received radiation;
(d) an insulating layer of dielectric material formed on a surface of said epitaxial layer;
(e) at least one heavily doped layer in a portion of the interface between said epitaxial layer and said substrate over said detector region and one heavily doped surface layer in said epitaxial layer to provide a conducting path for the transfer of charge carriers under appropriate biasing conditions from said optical detector region to said surface of said epitaxial layer; and
(f) a plurality of electrode means spaced from said epitaxial layer by at least a portion of said insulating layer for processing charge generated in said optical detector region and moving it along said epitaxial layer to a utilization circuit.

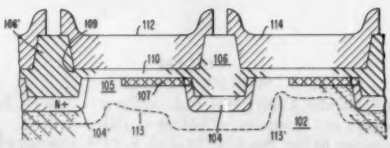
4,142,199
BUCKET BRIGADE DEVICE AND PROCESS

Victor M. Simi, Lexington, Ky., and Donald A. Soderman, Vienna, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,876

Int. Cl.[2] H01L *29/78, 29/06;* G11C *19/28*

U.S. Cl. 357—24 **10 Claims**



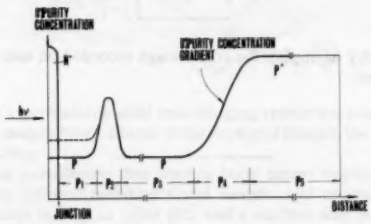
1. In a bucket brigade device including a series connected arrangement of cells all in a semiconductor substrate with each cell including a storage means for storing a charge signal and a transfer means connected to a source of periodic voltage pulses for transferring said stored charge signal in said substrate to the next series connected cell in the bucket brigade device in response to said periodic voltage pulses, each of said cells having a structure comprising:
(a) a semiconductor substrate of a first conductivity type, having a surface;
(b) a first diffusion region of a first cell, of a second conductivity type having a thickness in said surface of said substrate;
(c) a second diffusion region for a second cell serially connected and adjacent to said first cell, of said second conductivity type, spaced from said first diffusion region, having a thickness in said surface of said substrate;
(d) an ion-implanted drain region for said first cell of said second conductivity type, located between said first and second diffusion regions, adjacent to and serially connected with said second diffusion region and spaced from said first diffusion region forming an asymmetric channel region in said substrate between an unimplanted surface adjacent to said first diffusion and the implanted surface of said ion-implanted drain region adjacent to said second diffusion, having a thickness less than that for said first and second diffusion regions in said surface of said substrate;
(e) a thin insulating layer lying on the surface of said substrate over said channel and ion-implanted drain regions;
(f) a thick insulating layer lying on the surface of said substrate over said first and second diffusion regions;
(g) a gate conductor layer lying over said thin insulating layer;
said bucket brigade device cell being formed as a merged charge storage capacitor and FET structure having a

threshold voltage whose sensitivity to the source-to-drain potential is reduced yielding a high charge transfer efficiency, the cell being denser due to the superposition of the drain region which serves as the capacitor, and the thin insulating layer and a reduced parasitic capacitance to the substrate due to the reduced sidewall area of the ion-implanted drain region.

4,142,200
SEMICONDUCTOR PHOTODIODES

Yoshihiko Mizushima, Fuchu; Kenji Kajiyama, Kodaira; Tatsuya Kimura, Tokorozawa, and Hiroshi Kanbe, Tanashi, all of Japan, assignors to Nippon Telegraph & Telephone Corp., Japan

Filed Oct. 20, 1976, Ser. No. 734,182
Claims priority, application Japan, Oct. 27, 1975, 50-129630
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **9 Claims**



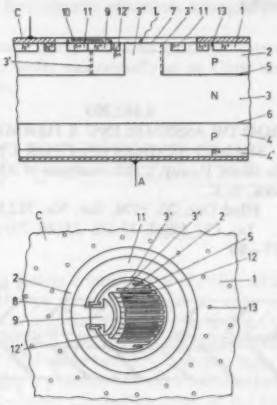
1. A semiconductor photodiode of the type including a junction between semiconductor regions containing impurities of different conductivity types and wherein photo-electric conversion is effected by utilizng the avalanche multiplication phenomena of carriers; one of said regions comprising first, second, third and fourth contiguous zones, said first zone being contiguous to said junction and containing a first conductivity type impurity at a relatively low concentration relative to said second zone, and said second zone being contiguous to said first zone on the side thereof opposite said junction and containing said first conductivity type impurity at a substantially higher concentration than the impurity concentration of said first zone, said third zone being contiguous to said second zone on the side thereof opposite said first zone and containing said first conductivity type impurity with the impurity concentration in said third zone being lower than the impurity concentration of said second zone at the intersection of the second and third zones and with the impurity concentration of said third zone gradually increasing to a substantially higher concentration in a direction away from the intersection of the second and third zones to thereby form an impurity concentration gradient, and said fourth zone being contiguous to said third zone on the side thereof opposite said second zone and containing said first conductivity type impurity at the substantially higher concentration.

4,142,201
LIGHT-CONTROLLED THYRISTOR WITH ANODE-BASE SURFACE FIRING

Roland Sittig, Umiken, and Patrick DeBruyne, Station Siggenthal, both of Switzerland, assignors to BBC Brown, Boveri & Company, Baden, Switzerland

Filed Jun. 1, 1977, Ser. No. 802,476
Claims priority, application Switzerland, Jun. 2, 1976, 6930/76; Apr. 15, 1977, 4680/77
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—38 **15 Claims**

1. A light-controlled thyristor comprising:
a pair of main electrodes comprising a cathode electrode and an anode electrode;
a semiconductor chip having at least four zones of alternating opposite conductivity types, the first zone contacted by said cathode electrode and the fourth zone contacted by said anode electrode, the first and fourth zones acting as emitter zones, the second zone adjoining the first zone, and the third zone of lowest doping lying between the second and fourth zones, a forward blocking PN-junction being formed between the second and third zones, both the second and the third zones together with the forward blocking PN-junction formed between them extending to a surface of the semiconductor chip on the side with the first zone, and current concentration means comprising at least a part of said third zone extending to the surface forming a curve, said curve at least substantially circumscribing a part of said second zone extending to said surface, the thyristor triggering when the portion of the forward blocking PN-junction reaching the surface is irradiated with light;



a highly doped zone of the conductivity type of the first zone provided in the surface of the semiconductor chip, the part of the third zone extending to the surface at least partially circumscribing a part of the highly doped zone whereby irradiation of said forward blocking PN-junction produces a current in said second zone, which current is concentrated by said curve toward said highly doped zone; and,
an electrical contact connecting the highly doped zone with the second zone outside the part of the second zone surrounded by the third zone at the surface.

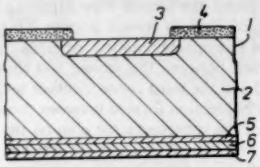
4,142,202
MULTI-LAYER METAL CONNECTING CONTACT AND METHOD FOR MAKING IT

Andreas Csillag; Dieter Löcher, both of Leingarten, and Klaus Wedermann, Neckarsulm, all of Fed. Rep. of Germany, assignors to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,455
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603745; Jul. 30, 1976, 2634263
Int. Cl.[2] H01L *23/48*
U.S. Cl. 357—71 **9 Claims**

1. A multi-layer metal connecting contact which is disposed on a semiconductor body, and in which at least one layer comprises gold wherein: a first gold layer is arranged directly on a portion of said semiconductor body, which portion is of a certain conductivity type; said first gold layer is covered by a second gold layer which contains an impurity material which produces said certain type of conductivity in the semiconductor material of said semiconductor body; said second gold layer is covered by a third gold layer; and a metal layer se-

quence of nickel and silver, of chromium and silver, or of titanium, palladium and silver is arranged on said third gold



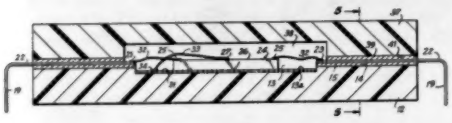
layer with the silver layer being the outer layer of said connecting contact.

4,142,203

METHOD OF ASSEMBLING A HERMETICALLY SEALED SEMICONDUCTOR UNIT

Raymond L. Dietz, Poway, Calif., assignor to AVX Corporation, Great Neck, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,545
Int. Cl.[2] H01L *39/02, 23/48, 29/44*
U.S. Cl. 357—80 **10 Claims**



1. A single layer metallizing material for bonding an integrated circuit metal oxide semiconductor in a ceramic base comprising a dispersion having the formulation:

Gold	48.5%
Silver	2.5%
Glass Powder	4.0%
Ethyl Cellulose T-200	2.8%
Terpineol 318	42.2%
	100.0%

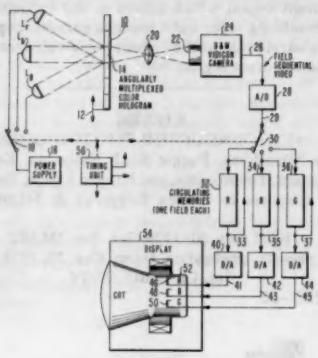
4,142,204

COLOR IMAGE STORAGE AND DISPLAY UTILIZING HOLOGRAPHY

William J. Hannan, Concord, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 9, 1977, Ser. No. 849,808
Int. Cl.[2] H04N *9/02, 9/54*
U.S. Cl. 358—2 **7 Claims**

1. A color image storage and display system, comprising
a hologram having two angularly-related gratings representing two respective colors in an image,
a black-and-white vidicon camera positioned to receive diffracted light from said hologram,
means successively to illuminate said hologram from two different angles to successively read out two respective color-representing images onto the face of said black-and-white vidicon camera,
two circulating memories each receiving from said camera electrical video signals representing a respective color field of the image,
a cathode ray tube color display unit, and
means repeatedly to apply the two video signals from the two memories in parallel to the color display unit,



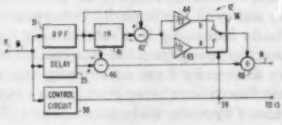
whereby to display the color image recorded on said hologram.

4,142,205

INTERFRAME CODEC FOR COMPOSITE COLOR TV SIGNALS COMPRISING MEANS FOR INVERTING THE POLARITY OF CARRIER CHROMINANCE SIGNALS IN EVERY OTHER FRAME OR LINE

Kazumoto Iinuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1977, Ser. No. 816,992
Claims priority, application Japan, Jul. 21, 1976, 51-87037; Nov. 25, 1976, 51-141949
Int. Cl.[2] H04N *9/32*
U.S. Cl. 358—13 **18 Claims**



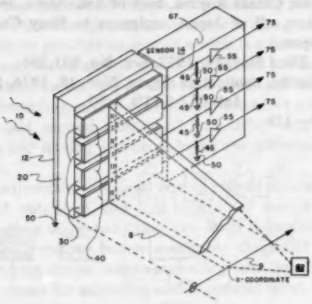
1. In a system for carrying out conversion between a composite color television signal and an interframe encoded signal, said television signal comprising a luminance signal and a carrier chrominance signal, said carrier chrominance signal being a subcarrier modulated by baseband chrominance signals, an encoder comprising:
converted signal producing means responsive to said television signal for producing a converted signal in which the polarity of said carrier chrominance signal is inverted in every other frame period of said television signal; and
interframe encoding means for interframe encoding said converted signal into said interframe encoded signal.

4,142,206

PYROELECTRIC SOLID STATE IMAGER

Reinhard D. Ennulat, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1977, Ser. No. 808,837
Int. Cl.[2] H01I *29/45*
U.S. Cl. 358—113 15 Claims



1. In a pyroelectric solid state imaging system for producing visible images from infrared radiation signal images, the system comprising:

a thin pyroelectric disc sensing layer means responsive to said infrared radiation signal images, said sensing layer means having an input side and a readout side in which said input side receives said infrared signal radiation images whereby charge patterns are generated in said sensing layer means according to temperature patterns produced by absorption of said infrared radiation signal images;

a plurality of parallel readout channels comprising a plurality of photoconductor switching means contiguous with said readout side of said sensing layer means wherein said plurality of photoconductor switching means activates a plurality of picture elements on said plurality of parallel readout channels; and

readout means in cooperation with said plurality of parallel readout channels for presenting a visible image of said infrared radiation signal image in a visual display area, said readout means comprising,

a visible radiator display device;

a plurality of output video electronic channels each having an input connected to one of said plurality of parallel readout channels and having outputs therefrom applied to said visible radiator display device; and

a light source and scanning means, said light source and scanning means producing a narrow light beam that is orthogonal to said plurality of parallel readout channels in which there is only one illuminated picture element per readout channel at a particular instant and wherein said narrow light beam is swept across said plurality of photoconductor switching means in synchronism with the sweep of said visible radiator display device to provide said visible images in said visual display area.

4,142,207

FERROELECTRIC IMAGING SYSTEM

Kent McCormack, Richardson, and William M. Knight, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1977, Ser. No. 862,269
Int. Cl.[2] H01J *31/49*
U.S. Cl. 358—113 7 Claims

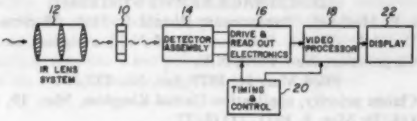
1. An improved ferroelectric imaging system comprising:

(a) a chopper for alternately interrupting infrared energy emanating from a scene;

(b) a leas system for focusing the infrared energy emanating from a scene;

(c) a ferroelectric detector matrix in the optical path of the lens system for receiving the alternating infrared energy, said ferroelectric detector matrix including a ferroelectric wafer, a layer of electrical conducting material covering substantially a first side of the ferroelectric wafer, busbars formed on the layer of electrical conducting material for connection to a biasing source of power for charging the layer of electrical conducting material, a plurality of electrical conducting pads arranged in rows and columns on a second side of the ferroelectric wafer, the plurality of electrical conducting pads forming a plurality of lower plates, said layer of electrical material, ferroelectric wafer, and plurality of electrical conducting pads forming a plurality of ferroelectric capacitors arranged in rows and columns;

(d) a temperature controlled heat sink for maintaining the ferroelectric wafer substantially at its Curie temperature for operation;



(e) a switching matrix comprising a plurality of solid state switches including a switch for each ferroelectric capacitor, a drive and read out electronics including a timing and control circuit for selectively opening and closing the plurality of solid state switches synchronously with the chopper action, a plurality of switch lines, said plurality of solid state switches connecting rows of the plurality of ferroelectric capacitors to the plurality of sense lines, said sense lines connected to a reference voltage and operative in response to selected switching action to read out signals representative of the infrared energy impinging on the ferroelectric capacitors, and at least one preamplifier for amplifying the electric signals;

(f) a video processor operative in response to the amplified electrical signals for providing electrical signals in a display format; and

(g) a display connected to the video processor for displaying the electrical signals representative of the infrared image of the scene.

4,142,208

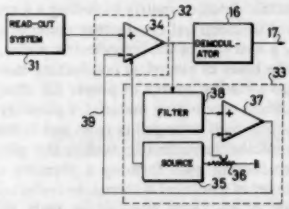
SYSTEM FOR AUTOMATICALLY CORRECTING THE DUTY FACTOR OF THE CARRIER WAVE ARISING FROM READING-OUT A DATA CARRIER

Pierre Oprandi; Jean-Claude Lehureau; Claude Puech; Jean-Paul Peltier; Francois Le Carvennec; Jean-Pierre Lacotte, and Claude Bricot, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Jul. 15, 1977, Ser. No. 816,080
Claims priority, application France, Jul. 16, 1976, 76 21819
Int. Cl.[2] H04N *5/76;* G11B *7/00*
U.S. Cl. 358—127 4 Claims

1. A system for demodulating a signal obtained from reading out a data carrier, said system comprising: frequency demodulator means; waveform conversion means for producing a rectangular waveform in response to said signal, and applying said rectangular waveform to the input of said demodulator means; and means for automatically correcting the duty factor of said rectangular waveform said correcting means comprising filter means connected to the output of said waveform conversion means for selectively transmitting the mean amplitude of said rectangular waveform, voltage comparator means having a first input connected to the output of said filter means and a second input fed with a reference voltage, and feedback

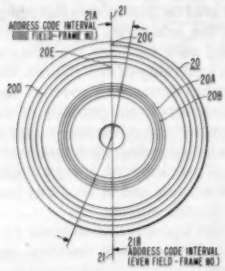
means connecting the output at said comparator means to a control input of said waveform conversion means; the voltage applied to said control input controlling the switching threshold of said waveform conversion means; said reference voltage being adjusted for causing the duty factor of said rectangular waveform of being substantially equal to 0.5.



4,142,209
DISC TRACK SERVO SYSTEM

Lee V. Hedlund, Cinnaminson; Ronald P. Fink, Marlton, and David I. Wright, Riverton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,474
Claims priority, application United Kingdom, Mar. 19, 1976, 11118/76; Mar. 8, 1977, 11118/77
Int. Cl.[2] G11B 7/00
U.S. Cl. 358—128 **4 Claims**



1. In a video disc information record and playback apparatus, for use with a source of signal information including video type frame, field and line synchronization signals, for effecting signal information recording, on a disc record medium, along spaced apart, elongated tracks, said apparatus including control means for recording said signal information at desired locations on said disc record medium and for the playback of said signal information from said desired locations; the combination comprising:

means responsive to said frame synchronization signal for generating a plurality of identical address indicating code signals corresponding to each frame of signal information, each of said frame address code signals including a timing control component, a track identification component, and an odd or even field identification component;

means for mixing the address indicating code signals from said generating means with the corresponding frame of signal information in a manner providing output signals corresponding to the insertion of one of said plurality of identical address indicating code signals in each of at least two consecutive intervals between line synchronization signals in each of the field constituents of said frame of signal information, whereby each of said field constituents of a given frame of signal information includes at least two of said identical address indicating code signals;

said control means including:

means for decoding said address indicating code signals during playback;

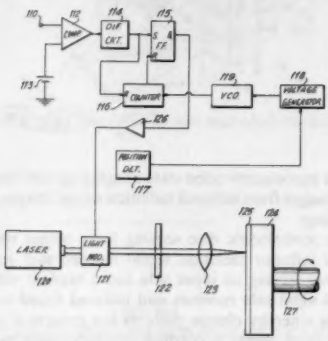
comparator means for comparing the decoded address indicating code signals with a signal corresponding to a given desired location on said disc record medium; and

means coupled to said comparator means for reading out the signal information located at said given desired location.

4,142,210
ROTATABLE RECORD CARRIER AND METHOD AND APPARATUS FOR PRODUCING SAME

Takashi Otobe; Chiaki Kojima, both of Yokohama, and Hiroshi Ohki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1977, Ser. No. 851,304
Claims priority, application Japan, Nov. 18, 1976, 51-138821
Int. Cl.[2] G11B 7/00
U.S. Cl. 358—128 **20 Claims**

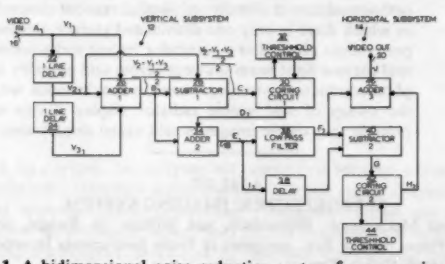


1. A method of recording information in substantially concentric circular tracks on a photoresponsive record carrier which is rotated at a constant angular velocity, comprising the steps of scanning said record carrier by a beam of light; modulating said light beam with an information signal to record spaced apart pits in each of said tracks, said spaced apart pits representing said information; and maintaining a constant length for each pit in each track relative to the radius of said track despite the change in the radius from one track to the next track being scanned.

4,142,211
BIDIMENSIONAL NOISE REDUCTION SYSTEM FOR TELEVISION

Yves C. Faroudja, Los Altos Hills, Calif., assignor to Microtime, Inc., Bloomfield, Conn.

Filed Nov. 23, 1977, Ser. No. 854,102
Int. Cl.[2] H04N 5/21, 9/535
U.S. Cl. 358—167 **10 Claims**



1. A bidimensional noise reduction system for processing a television video signal of recurrent fields of sequentially displaced parallel scanning lines of equal length, said system comprising a vertical dimension noise reduction subsystem including:

(a) a system input;

(b) delay and separation means connected to said system

input for providing three outputs: a first output corresponding to said system input, a second output corresponding to said system input delayed by one time period of each of said scanning lines, and a third output corresponding to said system input delayed by two time periods of each of said scanning lines, said delay and separation means having an output;

(c) first combiner matrix means connected to said vertical delay and separation means for combining said first, second and third outputs in accordance with a predetermined formula to provide an output which is a function thereof;

(d) first subtractor matrix means connected to said delay and separation means and to said first combiner matrix means for subtracting said output of said combiner matrix means from said second output of said delay and separation means and having an output being the difference therebetween;

(e) first adjustable-threshold coring circuit means connected to said output of said first subtractor matrix means for eliminating noise and other low level components of said difference output below a settable threshold level, said first coring circuit means including first threshold adjustment means for adjusting said threshold level, and having an output;

(f) second combiner matrix means connected to said outputs of said first combiner matrix means and said first coring circuit means for combining the signals therefrom, and having an output, and

a horizontal dimension noise reduction subsystem including:

(g) complementary high pass and low pass filter means having an input connected to said second combiner matrix means, and having a low frequency output and a high frequency output, said filter means for dividing the signal put out by said second combiner matrix means into said low frequency output and said high frequency output;

(h) second adjustable-threshold coring circuit means connected to said high frequency output of said filter means for eliminating noise and other low level components of said high frequency output below a settable threshold level, said second coring circuit means including second threshold adjustment means for adjusting said threshold level, and having an output;

(i) third combiner matrix means connected to said low frequency output of said filter means and to said output of said second coring circuit means, for combining said low frequency output and said second coring circuit means output into a system output signal, and providing it as a system output.

4,142,212

TWO-DIMENSIONAL SURFACE ACOUSTIC WAVE IMAGE SCANNING

Marion L. Scott, Ridgecrest, and Kenneth M. Lakin, Palos Verdes, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1977, Ser. No. 822,126
Int. Cl.[2] H04N *3/14*
U.S. Cl. 358—213 **19 Claims**

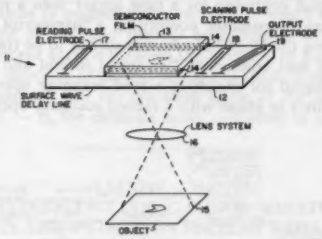
1. A method of electro-optical scanning comprising:

illuminating a layer of photosensitive material with a two-dimensional optical image in a predetermined image area;

applying a first short-duration, electrical pulse to a first end of a layer of piezoelectric placed in close proximity to said photosensitive material whereby a surface acoustic wave scanning pulse is caused to traverse the area adjacent said image area in a first dimension;

applying a second electrical pulse of the same relative duration as said first short-duration electrical pulse to a second end opposite said first end of the layer of piezoelectric material whereby a surface acoustic wave reading pulse is caused to traverse the area adjacent said image area in the same dimension but in an opposite direction of said surface acoustic wave scanning pulse;

intercepting said surface acoustic wave reading pulse at a point which represents a line scan across said image; and



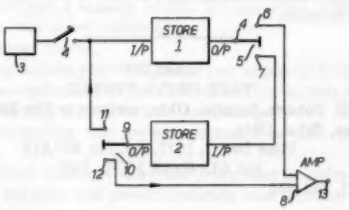
repeating the foregoing three steps at different intercepting points spaced at different path lengths and extending across the piezoelectric layer in a dimension transverse to the dimension of propagation of said scanning and reading surface acoustic wave pulses, whereby a line-by-line scan of the two dimensional optical image is obtained.

4,142,213

APPARATUS FOR ELIMINATION OF DARK CURRENT UTILIZING CHARGE COUPLED DEVICES

Stephen J. Glenn, Chelmsford, England, assignor to Diller, Ramik & Wight and Elliott Brothers (London) Limited, Chelmsford, United Kingdom

Filed Mar. 29, 1977, Ser. No. 782,370
Claims priority, application United Kingdom, Mar. 31, 1976, 12908/76
Int. Cl.[2] H04N *5/14, 5/21, 5/30, 3/14*
U.S. Cl. 358—221 **6 Claims**



1. An electronic arrangement including a charge coupled device utilised as a storage element for data wherein in order to compensate for dark current effects there is provided a second charge coupled device, means for applying data to said first charge coupled device during one portion of a storage period, means for transferring the stored content of said one charge coupled device to said second charge coupled device for storage during a following portion of said storage period and means for subtractively combining the stored contents of both charge coupled devices at the end of said storage period.

4,142,214

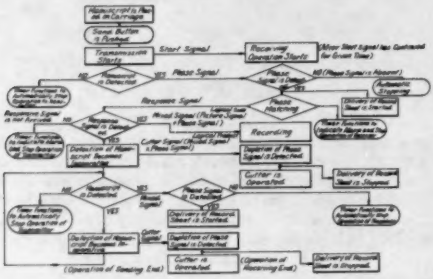
APPARATUS FOR CONTROLLING FACSIMILE TRANSMITTER AND RECEIVER

Masaru Yamazaki; Susumu Okusho, and Takayuki Anami, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,860
Claims priority, application Japan, May 24, 1976, 51-58991
Int. Cl.[2] H04N *1/32, 1/36*
U.S. Cl. 358—257 **9 Claims**

1. An apparatus for controlling a facsimile transmitter and

receiver in which operations at a receiving end are automatically effected in succession by a control signal delivered from a sending end, comprising a facsimile transmitter for delivering a continuous "1" signal, and a facsimile receiver operative to be automatically started into operation when said continuous "1" signal continues for a time longer than a predetermined time, said transmitter comprising a manuscript detector for detecting the front end of a manuscript to be transmitted and causing said continuous "1" signal to end and producing a phase signal for matching a read scanning operation at said transmitter in phase with a record scanning operation at said



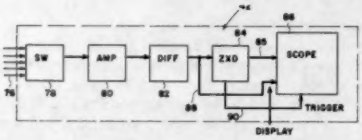
receiver, said phase signal being produced when the front end of the manuscript is detected by said manuscript detector, said receiver comprising a detector for detecting said phase signal within a given time after the end of said continuous "1" signal and causing a record sheet to advance, the relative positions between the front end of said manuscript and a reading head at said transmitter and the relative position between the front end of said record sheet and a recording head at said receiver being determined such that when the front end of said manuscript arrives at said reading head at said transmitter, the front end of said record sheet simultaneously arrives at said recording head at said receiver.

4,142,215

TAPE DRIVE TESTER

Clyde D. Roberts, Sapulpa, Okla., assignor to The Telex Corporation, Tulsa, Okla.

Filed Dec. 2, 1977, Ser. No. 857,011
Int. Cl.[2] G11B *27/36, 5/09*
U.S. Cl. 360—31 **4 Claims**



1. Apparatus for testing a tape drive unit having at least one write head, one read head, and a tape; and at least one adjustment means of the tape mechanism, to effect a change in peak shift or waveform, comprising:

(a) means for generating a selected composite pattern of square waves, including a direct pattern and a reversed pattern; and means for repetitively writing said composite pattern on said tape;

(b) means for reading the repetitions of said composite pattern from the said tape, and amplifying and differentiating the signal from said read head, to provide a read signal, and means to apply said read signal to an oscilloscope for display;

(c) means to trigger the sweep of said oscilloscope at a selected time in said read signal for each of said direct pattern and said reversed pattern, of said composite pattern;

whereby analog pattern signals will be displayed on the oscilloscope screen for the critical parts of both the direct and reversed portions of said composite pattern;

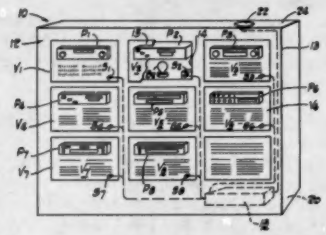
whereby changes in the displayed pattern can be observed for specific changes made in said adjustment means of said tape unit.

4,142,216

AURAL-VISUAL PRODUCT DISPLAY

Stanley B. Goss, Pepper Pike; Martin J. Nagel, Northfield Center, and Ole K. Nilssen, Chagrin Falls, all of Ohio, assignors to Tenna Corporation, Cleveland, Ohio

Division of Ser. No. 436,523, Jan. 25, 1974, Pat. No. 3,983,550.
This application Sep. 16, 1976, Ser. No. 723,797
Int. Cl.[2] G11B *15/18, 21/08*
U.S. Cl. 360—72 **14 Claims**



1. A system for selecting and emitting any one of a plurality of recorded groups of information comprising:

a plurality of transducers sensitive to information recorded on an endless loop medium that has a single surface, a greater number of side-by-side recorded tracks than the number of transducers and that is relatively movable with respect to the transducers, the recorded tracks being substantially equal in length and arranged on the medium for immediate successive retrieval of recorded information from any track following emitting of a previous group,

means to move the transducers in unison relative to the surface of the medium in a direction across the recorded tracks to change the positional relationship between the transducers and the medium,

a plurality of selectors each for individually selecting for use fewer than all of said transducers and the positional relationship between the transducers and said surface to select from a plurality of recorded groups of information located on the different tracks on said surface,

means associated with the transducer to emit information received by the transducer,

means, responsive to a single operation of one selector, to select for use fewer than all of said transducers, to move one of the transducers and the information-carrying surface relative to the other in a direction across said tracks to establish the selected positional relationship, and to energize said emitting means, and

control means associated with said selectors to prevent operation of the selectors from effecting selection of a message during the emitting of a previously selected group of information,

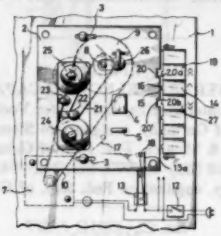
whereby, when a surface of a medium carrying recorded groups of information cooperates with said transducers and emitting means, a selected group of recorded information is emitted.

4,142,217

SWITCHING DEVICE FOR A TAPE RECORDER

Helmut Laufer, St. Georgen, Fed. Rep. of Germany, assignor to Dual Gebrüder Steidinger, St. Georgen, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,409
Int. Cl.[2] G11B *15/10*
U.S. Cl. 360—90 5 Claims



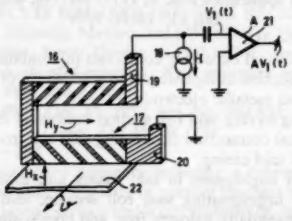
1. A tape playback device comprising
first drive means for driving a recording tape for playback,
second drive means for driving the recording tape for fast winding,
a motor means for being selectively operatively coupleable with said first and second drive means for driving the recording tape, respectively, said motor means including a motor circuit,
a magnetic head means for playback of sound events,
a carrier plate constituting a carrier for said magnetic head means and arranged displaceable in its plane,
a first operating element means arranged for bringing said first drive means into operation with the tape and for displacing said carrier plate through a first displacement to a first operating position wherein the tape abuts said magnetic head means,
second operating element means arranged for bringing said second drive means into operation with the tape and for displacing said carrier plate to a second operating position the latter constituting a portion of said first displacement to said first operating position,
switch means for closing said motor circuit, said switch means being coupled with said carrier plate such that said switch means is closed when said carrier plate is displaced into said first and second second operating positions, respectively.

4,142,218

MAGNETORESISTIVE HEAD

Frederik W. Gorter, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 677,054
Claims priority, application Netherlands, Apr. 14, 1975, 7504396; Apr. 15, 1975, 7504442
Int. Cl.[2] G11B *5/30;* H01C *7/16*
U.S. Cl. 360—113 8 Claims



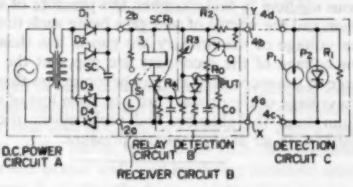
1. A magnetic reading device for detecting information-representing magnetic fields on an associated magnetic recording medium which comprises: a number of flat magnetoresistive elements each having an in-plane easy axis of magnetisation and each comprising at their ends electric contacts via which the elements are connected to an electric circuit for detecting their resistance variations, said elements including a first and a second magnetoresistive elements having equally oriented directions of magnetisation, on each of which is provided a pattern of mutually parallel equipotential strips to adjust the quiescent angle α between the direction of magnetization and the direction of current passage of the first element between 30° and 60° and the quiescent angle of the second element at $360° - \alpha$, the elements being connected in series.

4,142,219

TWO-WIRE SYSTEM INCLUDING SIGNAL RECEIVING SECTION AND DETECTION SECTION WITH PROTECTED RELAY

Katsutoshi Kuwabara, Yamato, and Kanji Ishii, Machida, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Feb. 16, 1977, Ser. No. 769,197
Claims priority, application Japan, Feb. 20, 1976, 51-18255[U]
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—18 2 Claims



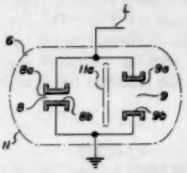
1. A two-wire system including a power source for supplying electric power, a signal receiving section for receiving a sensing signal and a sensing section for providing a sensing signal in the two wires, comprising:
a D.C. power source,
a receiving section provided with a pair of power terminals and also another pair of sensor terminals for the two wires, said receiving section further comprising:
means connecting said power terminals to said power source,
a relay circuit having a relay and a thyristor in series connected between said power terminals, said thyristor having a gate,
a resistor connecting one of said pair of power terminals to one of said sensor terminals,
a switching-transistor having an emitter-bare circuit connected in parallel with said resistor and operative in response to a voltage difference across said resistor,
a buffer circuit provided between the gate of said thyristor and the collector of said switching transistor, and
a plurality of sensing sections connected in parallel to said pair of sensor terminals, each sensing section including:
a sensing device connected across said sensor terminals for providing an output upon sensing a predetermined condition;
a switching circuit connected between said sensor terminals, parallel to the sensing device, and operative upon receiving an output from the sensing device, and
a capacitor connected in parallel with each sensing device for preventing a voltage drop upon activation of said power source,
whereby after the power source is activated the collector of said switching-transistor is prevented from activating the gate of said thyristor by said buffer circuit during a transition time in which said capacitors are being charged.

4,142,220

MULTI ARC GAP SURGE ARRESTER

Paul S. Lundsgaard, Chicago, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Sep. 26, 1977, Ser. No. 836,585
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—120 **12 Claims**



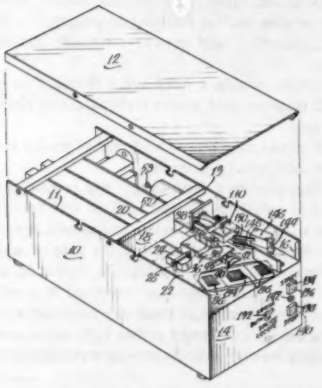
1. A multiple arc gap spark gap device comprising means forming a chamber, a first pair of opposed electrode surfaces defining a primary arc gap in said chamber, a second pair of opposed electrode surfaces forming a secondary arc gap in said chamber, the width of said primary arc gap being greater than the width of said secondary arc gap, said primary and secondary arc gaps being electrically coupled in parallel, an ionizable gaseous medium in said chamber, the pressure of said gaseous medium and the widths of said gaps being such that the breakdown voltage of the primary arc gap is less than the breakdown voltage of the secondary arc gap, but the breakdown voltage of the secondary arc gap becomes less than the breakdown voltage of the primary arc gap upon loss of said gaseous medium from the chamber and replacement thereof in the chamber with air at atmospheric pressure.

4,142,221

NAB TAPE CARTRIDGE ERASER AND SPLICE FINDER

John P. Jenkins, Towanda, and John Fesler, Mackinaw, both of Ill., assignors to International Tapetronics Corp., Bloomington, Ill.

Filed Mar. 31, 1977, Ser. No. 783,303
Int. Cl.[2] H01F *13/00*
U.S. Cl. 361—151 **14 Claims**



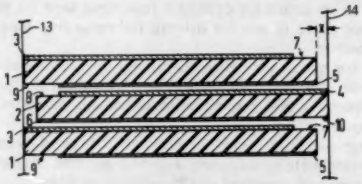
1. A combined eraser and splice finder for recording tape cartridges of the type having an endless loop of tape therewithin conformed in a rotatable coil and a loose bight leaving the inside of said coil and returning to the outside thereof, said loop being comprised of a length of tape with the ends thereof spliced together, comprising a capstan for driving said tape, a pressure roller movable to and away from a position of pinching an increment of said tape against said capstan to be driven thereby, means for moving said roller into said pinching engagement, means for retracting it therefrom, an electromagnet near said cartridge when said cartridge is placed for said tape-driving engagement such that said coil lies within the field of said electromagnet, means for generating an initially strong and progressively diminishing alternating field in said electromagnet, means for detecting a splice in said tape, means responsive to said splice detecting means for releasing said moving means to retract said pressure roller away from said capstan, and means inhibiting operation of said releasing means until after said field has diminished below the level of tape erasure.

4,142,222

REGENERABLE ELECTRIC CAPACITOR

Josef Kotschy, Unterhaching, and Walter Voelkl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,084
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623474
Int. Cl.[2] H01G *1/017*
U.S. Cl. 361—273 **3 Claims**



1. A regenerable AC electric capacitor which comprises wound-on layers of synthetic films provided on both sides with a metallization in direct layer contact with the synthetic films, exposed edge regions of the films not covered by metallization being arranged at opposite edges, one region on each of the two sides of the film, end-side contact layers connecting with the metallizations, said synthetic films being wound on with adjacent films being laterally offset with respect to one another and that the exposed edge regions on the two sides of the film surfaces have differing widths, the metallization on one side having a conductance substantially different than the metallization on the other side of the synthetic films, the metallizations comprising aluminum and the synthetic films polypropylene, and the metallizations of higher conductances being connected to said end-side contact layers and the metallizations of lower conductances are not directly connected to said end-side contact layers.

4,142,223

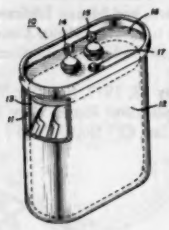
CAPACITOR WITH A STABILIZED NON HALOGENATED IMPREGNANT

David G. Shaw, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation of Ser. No. 669,755, Mar. 24, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,808
Int. Cl.[2] H01G *4/04*
U.S. Cl. 361—319 **24 Claims**

1. An electrical capacitor comprises in combination
a. a roll section comprising alternate layers of a dielectric strip and metallic electrode,
b. a casing having said roll section contained therein,
c. electrical connection connecting said electrodes to terminals on said casing,
d. and an impregnant in said casing and essentially completely impregnating said roll section, said impregnant being essentially halogen free, and comprising
(1) a dielectric liquid aromatic ester which is hydrogen gas negative over the range of about 40° C. to about 100° C., and

(2) an olefinic material dissolved therein, said olefinic material having a significantly higher hydrogen gas



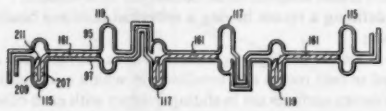
negative value than the said dielectric liquid impregnant.

4,142,224

CONTROL CENTER BUS BARS

John R. Wilson, Downers Grove; Brij M. Bharteey, Bolingbrook, and Neal E. Rowe, Oak Forest, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1977, Ser. No. 831,719
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—356 **1 Claim**



1. A control center for distributing power from a power supply source to power consuming devices, comprising a cabinet having a plurality of vertically spaced compartments on the front side of the cabinet, a plurality of vertical, horizontally spaced, bus bars in said cabinet, a circuit interrupter in one compartment and movable into and out of a position adjacent to the bus bars, each bus bar comprising a portion in a plane aligned with the direction of movement of the circuit interrupter, said portion having a bent-over configuration, the bus bars being formed from sheet metal stock, the bent-over portion of the bus bar being U-shaped and comprising a pair of spaced legs and an intermediate U-bend part, each leg having a planar surface adjoining and extending from the U-bend part and being substantially parallel to the other leg, at least one leg having inturned edge extending toward the other leg, and the inturned edge being spaced from the U-bend part by the planar surface.

4,142,225

PANELBOARD ASSEMBLY EMPLOYING HEAT TRANSMITTING INSULATOR ASSEMBLY AND A CIRCUIT BREAKER SECURING BEAD RECEIVED IN A CIRCUIT BREAKER HOUSING RECESS

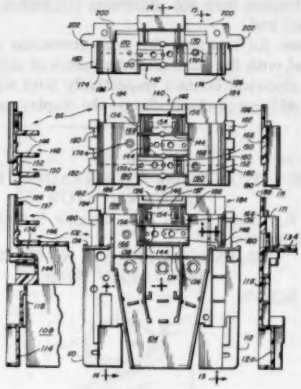
Raymond A. Diersing, Mexico, Ind.; Wilhelm T. Hackenbroch, Cedar Rapids, Iowa; George E. Schweikle, and Harris I. Stanback, both of Lexington, Ky., assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 17, 1977, Ser. No. 842,432
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—358 **12 Claims**

1. In a panelboard assembly including a cabinet having a metal support wall, a plurality of parallel bus bars each having a respective planar surface and a circuit breaker, the improvement comprising:

a plurality of modular insulating members located between said support wall and a first one of said bus bars with each insulating member having a first planar wall defined by spaced planar surfaces with one planar surface of each insulating member engaging said metal support wall of said cabinet and the other planar surface of each insulating member engaging said planar surface of said first bus bar, and

means on each insulating member positioning each first



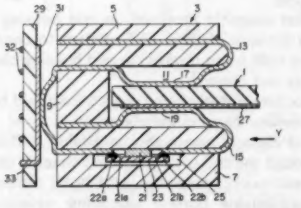
planar wall of each insulating member in aligned longitudinal relationship and each planar surface of one insulating member first wall in coplanar relationship with a respective one of the planar surfaces on each other insulating member first planar wall, said insulating members adapted to transmit heat directly from said first bus bar to said metal support wall.

4,142,226

MULTI-CONTACT ELECTRICAL EDGE CONNECTOR FOR DISPLAY PANELS

Adrian L. Mears, Cheltenham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 18, 1977, Ser. No. 843,189
Claims priority, application United Kingdom, Oct. 29, 1976, 45214/76
Int. Cl.[2] H05K *1/07*
U.S. Cl. 361—380 **5 Claims**



1. An edge connector for mounting on an edge of an opto-electric display panel which has a plurality of addressing electrodes to which electric voltage are applied to cause an observable display on the panel, said edge connector comprising:

a. an electrically insulating body for receiving the edge of a display panel between two parts of the edge connector,

b. drive electronics fixed to said insulating body and having a plurality of input terminals and a plurality of output terminals with a greater number of output terminals than input terminals, said drive electronics being capable of routing electrical signals applied to its said input terminals

to appropriate ones of its said output terminals determined by the signals received on said input terminals,

c. a first series of electrical conductors connected one to each of said input terminals and mounted in said body for external connection to control electronics,

d. a second series of electrical conductors connected one to each of said output terminals and mounted in said body for connection with the addressing electrodes on the display panel, and

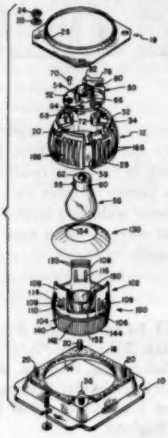
e. means for retaining the edge connector on the display panel with the electrical conductors of said second series for electrical contact respectively with separate ones of the addressing electrodes on the display panel.

4,142,227

COMBINATION PASSENGER READING LIGHT AND AIR VENTILATOR

Wallace R. Aikens, Plano, Tex., assignor to Gulton Industries, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,208
Int. Cl.[2] F21V *29/00*
U.S. Cl. 362—74 **15 Claims**



1. An orientable light and ventilating fixture comprising:

a housing having a channel extending axially therethrough, said housing being adapted for movement to position an axis thereof at any desired orientation within a conical region;

a socket assembly mounted on said housing at one end of said housing channel and adapted to engage an electric lamp bulb when inserted in said housing channel from the other end thereof;

said socket assembly being spaced from said housing to form an airflow channel therebetween;

a bezel element removably insertable within said housing through the end of said housing channel on the other side of said socket assembly, said bezel element including a manipulatable portion extending outwardly from said housing channel for permitting manual tilting adjustment of the axis of said housing and lamp, said bezel element portion also containing an airflow channel communicating with said housing channel for simultaneously orienting the direction of airflow through said housing channel and

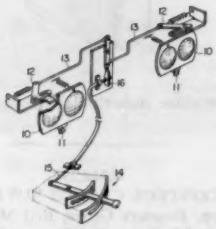
a reflector mounted on said bezel element and insertable therewith into said housing channel, said reflector having an opening to receive the lamp therethrough and being selectively adjustable on said bezel axially with respect to said lamp bulb thereby to surround selected portions of said lamp upon insertion of said bezel element with said lamp in place.

4,142,228

VEHICLE LAMP CASING OPTICAL AXIS ADJUSTING MECHANISM

Kimio Kumagai, Isehara, and Masao Ishikawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ichikoh Industries Limited, Tokyo, both of, Japan

Filed May 23, 1977, Ser. No. 799,789
Claims priority, application Japan, May 24, 1976, 51-65273
Int. Cl.[2] B60Q *1/06*
U.S. Cl. 362—233 **8 Claims**



1. A lamp casing optical axis adjusting mechanism for a vehicle, comprising:

a lamp casing;

a support frame adapted to be connected to a vehicle;

means defining a recess having a spherical concave bearing surface;

spherical means having a spherical convex surface and received in said recess in a condition in which said bearing and convex surfaces are in sliding contact with each other;

means for retaining said spherical means and said recess in said condition;

means for connecting said lamp casing and said support frame to said recess defining means and said spherical means so that said lamp casing is swingably supported by said support frame;

biasing means for swingingly urging said lamp casing in one direction;

an operating wire operatively connected to said lamp casing for effecting swinging movement of said lamp casing in another direction opposite to said one direction in opposition to the force of said biasing means; and

rotatable means supported by said support frame and in friction contact with said operating wire for changing the direction of movement of said operating wire to the direction of swinging movement of said lamp casing.

4,142,229

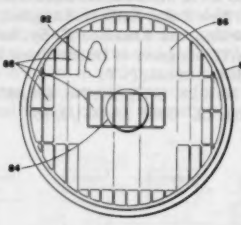
METHOD OF SHAPING A LAMP BEAM

Clarence E. Hulbert, Jr., 1549 E. Houston St., Muskogee, Okla. 74401

Filed May 23, 1977, Ser. No. 799,303
Int. Cl.[2] F21V *29/00*
U.S. Cl. 362—292 **5 Claims**

1. A method of altering the photometric output and distribution of a lamp beam from an auxiliary automobile headlamp of the type having a fluted lens cover and wherein said lamp beam is directed outward from said lamp through its lens cover comprising the steps of covering a central portion of said lens cover with an opaque material and covering a peripheral portion of said lens cover with an opaque material whereby the resulting lamp beam conforms to certain specifications requiring said

beam to have less than certain maximum outputs at certain angles referenced to said lamp and wherein said beam exceeds



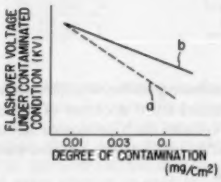
certain minimum outputs along a number of other angles referenced to said lamp to conform with SAE Standards J582a.

4,142,230

SEALED DC POWER CONVERTING STATION

Shiniti Menju, Atsugi, and Iwao Ohshima, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 24, 1977, Ser. No. 780,802
Int. Cl.[2] H02M *7/00*; H02J *3/36*
U.S. Cl. 363—51 **7 Claims**



1. A sealed DC power converting station comprising:

a bus bar group including at least one gas insulated conduit three phase AC bus bar, a gas insulated conduit first DC bus bar, and a second DC bus bar, said bus bar group being disposed at a central portion of said station;

a first group of sealed controlled semiconductor switching units disposed on one side of said bus bar group and a second group of sealed controlled semiconductor switching units disposed on the other side of said bus bar group opposite said first group of switching units, said first and second group of switching units being connected to said bus bar group through disconnectable gas insulated connection ducts;

a sealed smoothing reactor adapted to be connected in series with a DC transmission line, said reactor being connected to said first DC bus bar through a disconnectable gas insulated connection duct; and,

an arrestor provided for each of said gas insulated connection ducts.

4,142,231

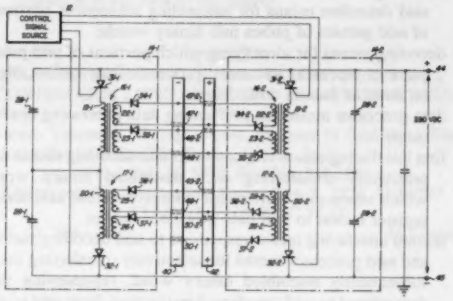
HIGH CURRENT LOW VOLTAGE LIQUID COOLED SWITCHING REGULATOR DC POWER SUPPLY

Edward A. Wilson, and John R. Nowell, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 3, 1978, Ser. No. 868,097
Int. Cl.[2] H02M *3/315*
U.S. Cl. 363—141 **8 Claims**

1. In a liquid cooled switching regulator power supply having at least one power module, said module having a pair of reactors, each reactor having a primary winding and a secondary winding, a pair of current switches for controlling current flow through the primary windings of the reactors, current rectifying means having an anode and a cathode connected in series with the secondary winding of the reactor to rectify current flow through said secondary winding, a first and a second chill plate, a liquid cooled heat exchanger for cooling the chill plates, means for fastening the chill plates and heat exchanger together so that the heat exchanger can cool the chill plates, the improvements comprising:

means for electrically insulating the chill plates from each other;



the reactors, current switches and current rectifying means of the power module being mounted on the first chill plate;

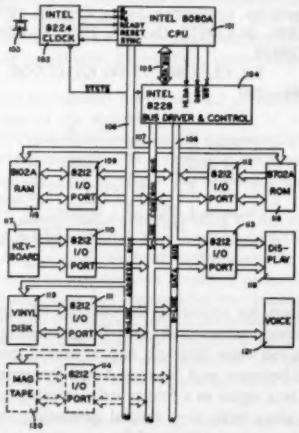
the anodes of the current rectifying means of the power module being connected to the first chill plate and the cathodes of the current rectifying means being connected to the second chill plate through the secondary winding of the reactor, whereby the first chill plate is the negative power bus and the second chill plate is the positive power bus of the power supply.

4,142,232

STUDENT'S COMPUTER

Norman L. Harvey, 127 Beverly Dr., SE, Winter Haven, Fla. 33880

Continuation-in-part of Ser. No. 375,455, Jul. 2, 1973. This application Dec. 18, 1975, Ser. No. 642,239
Int. Cl.[2] G06F *13/04, 7/28*; G11B *31/00*; G11C *17/00*
U.S. Cl. 364—200 **5 Claims**



1. A data processing apparatus, comprising:

a plastic disk on at least one face of which a sequentially organized combination of synchronization signals, proces-

sor instructions, and related data has been stored as undulations in aspiral groove;

transducer means for transforming the undulations into an electrical signal having a corresponding pattern of pulses;

detection means for identifying certain pulse patterns as said synchronization signals, each occurrence of which representing a predetermined reference point in the organized sequence of said instructions and data;

clocking means synchronized to said pattern of pulses;

serial register means responsive to said clocking means and said detection means for assembling subsequent portions of said pattern of pulses into binary words;

decoding means for identifying which portions of said pulse patterns represent addresses, processor instructions, digital data, or data in other forms;

data processor means for performing data processing operations;

first interfacing means responsive to said decoding means for selectively transferring each assembled binary word which represents a processor instruction from said serial register means to said data processor means;

second interfacing means responsive to said decoding means and said processor means for selectively transferring each subsequently assembled binary word, representing the data related to said transferred instruction, from said serial register means to said data processor means;

said data processor means performing the operations indicated by each said instruction upon its related data immediately upon completion of the respective transfers by said first and second interfacing means; and

output means for reporting the results of the operations performed on said transferred data.

4,142,233

REFRESHING SYSTEM FOR DYNAMIC MEMORY

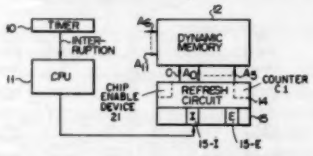
Seigo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 19, 1976, Ser. No. 733,925

Claims priority, application Japan, Oct. 30, 1975, 50-129872; Oct. 30, 1975, 50-129873; Oct. 30, 1975, 50-129874; Oct. 30, 1975, 50-129875

Int. Cl.² G06F *13/00*; G11C *7/00*

U.S. Cl. 364—200 **8 Claims**



1. A system for refreshing the contents of a dynamic memory comprising an external timer for generating a signal at a predetermined time interval, and a central processing unit connected between said timer and said dynamic memory for receiving said signal as a first priority interruption to the central processing unit, said central processing unit including means responsive to said signal for executing an instruction for refreshing the contents of a block of the dynamic memory or for executing a block transfer instruction in direct memory access mode

4,142,234

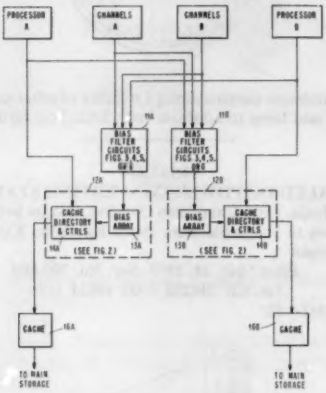
BIAS FILTER MEMORY FOR FILTERING OUT UNNECESSARY INTERROGATIONS OF CACHE DIRECTORIES IN A MULTIPROCESSOR SYSTEM

Bradford M. Bean, New Paltz; Keith N. Langston, Ulster Park; Richard L. Partridge, and Kian-Bon K. Sy, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1977, Ser. No. 855,485

Int. Cl.² G06F *13/00, 15/16*

U.S. Cl. 364—200 **21 Claims**



1. Means for reducing cache interference caused by remote processor or channel store accesses of a shared storage in a multiprocessing system, each processor having its own cache and its own buffer-invalidation-address-stack (BIAS), each processor having

a BIAS filter memory for storing remote store request addresses received from another processor or from a channel,

comparing means connected to an output of the filter memory and receiving each remote store request address, the comparing means comparing each received address with each current address in the filter memory to determine equality or inequality on a selected block size basis,

means for transferring the received remote store request address into the BIAS and into the BIAS filter memory when the comparing means provides an output signal indicating the received address is not validly contained in the filter memory, and the transferring means enabling the transfer of a received remote store request address into the local BIAS when the comparing means provides an output signal indicating the received address is validly contained in the filter memory.

4,142,235

ELECTRONIC CASH REGISTER

Yuji Tadakuma; Syunji Saito, and Toru Eguchi, all of Ohito, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 24, 1977, Ser. No. 799,987

Claims priority, application Japan, May 24, 1976, 51-59851; May 24, 1976, 51-59853; May 24, 1976, 51-59854

Int. Cl.² G07G *5/00*; G06C *29/00*; G06F *3/12*

U.S. Cl. 364—405 **7 Claims**

1. An electronic cash register comprising:

a keyboard having a plurality of entry keys, at least one department key and at least one transaction key;

data storing means including a first memory for storing sales amount data and a second memory for storing total sales amount for each transaction;

printing means for printing data on a recording paper;

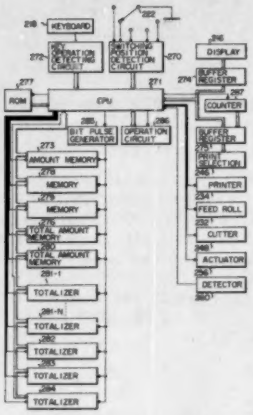
a money drawer;

detection means for detecting the closure of said drawer to produce an output signal;

cutting means for cutting said recording paper;

an operation circuit; and

data processing means coupled to said keyboard and including means for supplying to said storing means data defined by the key operation on said keyboard, for supplying an instruction signal to said printing means to thereby print said data on said recording paper, for supplying an instruction signal to said cutting means in response to an output



signal from said detection means to thereby cause said cutting means to cut the recording paper which is recorded with said data, for supplying an instruction signal to said operation circuit to thereby produce information drawn out from the sales amount data in said first memory and the total sales amount in said second memory, for supplying an instruction signal to said printing means to print said information from said operation circuit on said recording paper, and for supplying an instruction signal to said cutting means to cut said recording paper having said information recorded thereon.

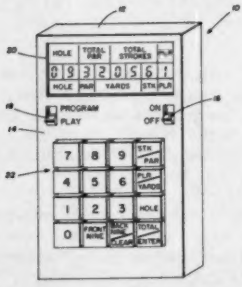
4,142,236
ELECTRONIC SCORECARD FOR GOLF

Kenneth L. Martz, 1532 Canadian Trail, Plano, Tex. 75023 and Roger L. Nations, Rte. 2, Anna, Tex. 75003.

Continuation-in-part of Ser. No. 787,617, Apr. 14, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,408

Int. Cl.[2] G06F *15/44*; A63B *57/00*

U.S. Cl. 364—411 **15 Claims**



1. An electronic scorecard for the game of golf, which comprises:

input means having switches representative of digits for selectively inputting numerical golf course data and player scoring data for at least one player;

said input means including switches representative of predetermined commands;

processing and memory means responsive to the input means for receiving the golf course and player scoring data, and for performing predetermined arithmetic operations on said data; and

output means responsive to the processing and memory means for visually presenting the selected golf course and player scoring data to the player.

4,142,237
PROCESS FOR TRACKING A WELDED JOINT IN A CONTINUOUS LONG MATERIAL IN A PRODUCTION LINE

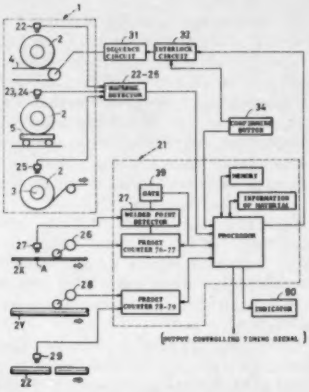
Ikutaro Yamasaki, Ibaragi, Japan, assignor to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1977, Ser. No. 819,198

Claims priority, application Japan, Aug. 5, 1976, 51-93799

Int. Cl.[2] G01B *7/34*; B21C *51/00*

U.S. Cl. 364—469 **16 Claims**



1. A process for tracking a welded joint in a continuous length of material while feeding same at a given feeding speed on a continuous production line in which two or more presettable counters are spaced apart from each other on the production line in the feeding direction thereof, said continuous length of material consisting of equal elementary lengths joined together lengthwise by welding, comprising the steps of:

calculating an anticipated length of each elementary length on the basis of the weight, type of material, width and thickness of said elementary length and presetting a count value corresponding to the length thus calculated in said presettable counters to which the welded joint is transported;

subtracting a count value corresponding to the actual feed length of the continuous length of material from said count value preset in each of said presettable counters, while feeding said continuous length of material;

making an assumption that said welded joint is present at the position in said production line of the presettable counter for which the result of said subtraction is zero; and

making a correction of said assumption of the presence of said welded joint, said correction being made by the steps consisting of:

detecting a welded joint without contacting same in one or more positions on said production line;

setting for a presettable counter corresponding to a position, in which said welded joint has been detected, a gate range covering ±n counts, with a center of said

range being taken at a position where the result of said subtraction is zero, thereby assuming that the welded joint is present at a position of the presettable counter corresponding to said detection position only when both the position at which the result of said subtraction is zero and the position at which a detection signal is derived are present at the same time; and

determining a deviation of the position at which a welded-joint detecting signal is produced as an output from the position at which the result of said subtraction is zero, within said gate range, and adding or subtracting a count value corresponding to said deviation to or from the count value preset in each of said presettable counters.

11. An apparatus for tracking a welded joint in a continuous length of a material while feeding same at a given feeding speed on a continuous production line in which two or more presettable counters are spaced apart from one another on the production line in the feeding direction thereof, said continuous length of material consisting of equal elementary lengths joined together in the longitudinal direction thereof by welding, comprising:

computing means for estimating the length of each of said elementary lengths;

means for converting the value obtained from the computing means into a pulse count value and presetting said pulse count value in each of said presettable counters;

speed detecting means for detecting the feed length from the feeding speed of said continuous length of material;

means for converting the value detected by said speed detecting means into a pulse count value and subtracting said pulse count value from the pulse count value preset in each of said presettable counters, as said continuous length of material is being fed;

means for resetting a pulse count value corresponding to an estimated length of the elementary length which corresponds to a distance from a leading welded joint to a trailing welded joint when one welded joint moves past a presettable counter and a pulse count value in the presettable counter is zero; and,

means for correcting the reset pulse count value including:

a non-contacting type, welded joint detector for detecting the actual welded joints in one or more positions on said production line;

comparing means having a gate range of $\pm n$ count, with the center of said range being taken at a position along said production line at which the result of the subtraction is zero, said comparing means being provided for determining a deviation of the position at which the result of said subtraction is zero from the position at which a detection output is produced from said detector; and

computing means for adding or subtracting a pulse count value corresponding to the deviation output of said comparing means to or from said reset pulse count value.

4,142,238
MONITORING SYSTEM

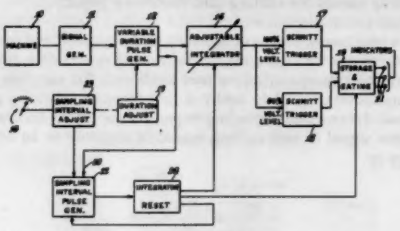
Robert W. Brandt, 65 Canal St., Apartment 20, San Rafael, Calif. 94901; Robert D. Fisher, Melrose Park, and James E. Hill, Prospect Heights, both of Ill., assignors to Robert W. Brandt, San Rafael, Calif.

Continuation-in-part of Ser. No. 339,421, Mar. 8, 1973, abandoned. This application Aug. 9, 1973, Ser. No. 386,958

Int. Cl.[2] D01H *13/14*; G07C *3/10*

U.S. Cl. 364—552 **30 Claims**

1. A system for measuring the rate of occurrence of events in a cyclically occurring series of said events, comprising first means for sensing the occurrences of said events and for generating a train of pulses, each of said pulses representing one of said events, second means responsive to said train of pulses for providing a signal having a characteristic which represents the rate of occurrence of said events, preset comparator means for providing a preselected standard value of said characteristic and for comparing said characteristic of said signal with said



standard value, and indicator means responsive to said comparator means for indicating said comparision.

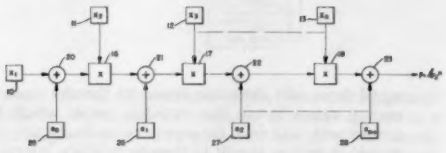
4,142,239
APPARATUS FOR GENERATING DIGITAL STREAMS HAVING VARIABLE PROBABILITIES OF ERROR

Richard C. Proto, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,391

Int. Cl.[2] G06F *1/00*

U.S. Cl. 364—717 **12 Claims**



1. An apparatus for generating a digital stream having variable error probabilities comprising:

means for generating n independent, random digital streams;

means for combining said random streams into a single output digital stream, in accordance with a combining function of the form

$$f = x_n(\ldots x_3(x_2x_1 + a_1) + a_2 \ldots) + a_{n-1}$$

where $x_1, x_2 \ldots x_n$ are variables representing the random digital streams and $a_1, a_2 \ldots a_{n-1}$ are coefficients of the variables $x_1, x_2 \ldots x_n$, said coefficients having the values 0 or 1; and

means connected to the combining means for selecting the values of said coefficients such that said output digital stream has a probability of the occurrence of a 1 of $k/2^n$, where k is an odd number less than 2^n.

4,142,240
AGILE CODE GENERATOR

Charles R. Ward, Passaic, and Robert A. Reilly, North Caldwell, both of N.J., assignors to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Aug. 31, 1977, Ser. No. 829,382

Int. Cl.[2] G06F *7/00*

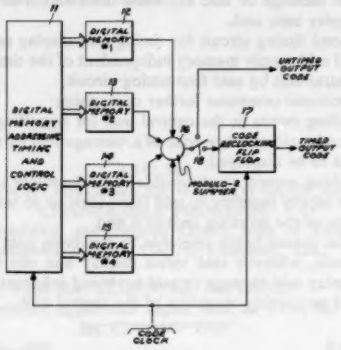
U.S. Cl. 364—717 **6 Claims**

1. A highly agile code generator for encoding and decoding information in secure and spread spectrum communication, navigation and data handling systems comprising:

a plurality of first means each storing at least one binary code sequence;

second means coupled in common to each of said plurality of first means for addressing each of said plurality of first means; and

third means coupled in common to each of said plurality of first means to modulo-2 add said binary code sequences

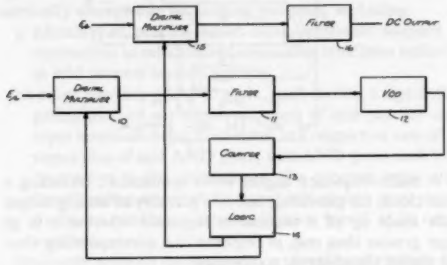


together to provide a pseudo random noise code sequence output from said generator.

4,142,241
HARMONIC INSENSITIVE PHASE SENSITIVE DEMODULATOR

Arthur Freilich, Plainview, and Avraham Kalron, Elmhurst, both of N.Y., assignors to North Atlantic Industries, Inc., Hauppauge, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,690
Int. Cl.[2] H03D *3/06*; G06F *15/34*
U.S. Cl. 364—724 **14 Claims**



1. A phase sensitive demodulator responsive to a reference signal having a frequency w and to an input signal comprising:

(a) means for synthesizing from said reference signal a sinusoidal function having a Fourier series substantially of the form sin

$$(wt + \theta) + \frac{1}{n+2}\sin(n+2)(wt+\theta) + \frac{1}{n+4}\sin(n+4)$$

$$(wt + \theta) + \frac{1}{2n+5}\sin(2n+5)(wt+\theta) +$$

$$\frac{1}{2n+7}\sin(2n+7)(wt+\theta) + \frac{1}{3n+8}\sin(3n+8)$$

$$(wt + \theta) + \frac{1}{3n+10}\sin(3n+10)(wt+\theta) + \ldots, n$$

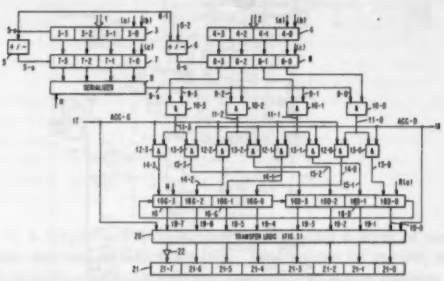
being an odd number and at least 7; and

(b) means for digitally multiplying said function and said input signal so as to render the demodulator output substantially insensitive to the nth and lower odd harmonics of w present in the input signal.

4,142,242
MULTIPLIER ACCUMULATOR

Henri P. Duvochel, Nice; Roland E. Kuhne, La Colle sur Loup, and Bernard P. Laurent, St Laurent du Var, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,312
Claims priority, application France, Dec. 11, 1976, 76 34820
Int. Cl.[2] G06F *7/52*
U.S. Cl. 364—759 **8 Claims**



1. A multiplier-accumulator for accumulating a sum of products of n-bit operands $S = \Sigma A_i B_i$ in which $A_i B_i$ are successively calculated and added to the sum of the preceding products comprising:

input means for holding a multiplier A_i and a multiplicand B_i of a product to be accumulated;

multiplying means responsive to said input means for providing the partial products of multiplicand B_i by each bit in the multiplier;

accumulating means containing 2n adding positions, and in which the contents of each position can be provided to the next adjacent position, the contents of the last position being provided to the first position; and

diverting means connected between said multiplying means and said accumulating means for transferring partial products of $A_i B_i$ to a predetermined n of said adding positions, and transferring partial products of $A_{i+1} B_{i+1}$ to the other n of said adding positions.

4,142,243
DATA PROCESSING SYSTEM AND INFORMATION SCANOUT EMPLOYING CHECKSUMS FOR ERROR DETECTION

Richard L. Bishop, Sunnyvale, and William A. Gibson, Cupertino, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed May 20, 1977, Ser. No. 798,985
Int. Cl.[2] G06F *11/02*
U.S. Cl. 364—900 **24 Claims**

1. A fault-detecting apparatus for processing information useful for detecting faults in the operation of a principal apparatus where the principal apparatus includes a plurality of principal circuit points each having a digital expected state and a digital actual state at any one point in time during the operation of said principal apparatus where the state of each said principal circuit point is faulty if the corresponding actual state is not the same as the expected state, said fault-detecting apparatus comprising,

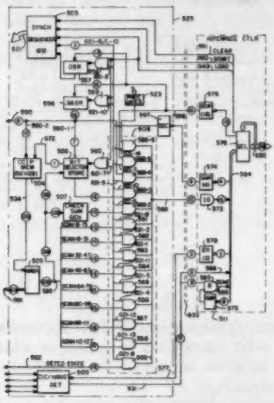
a secondary apparatus for processing state information independently from said principal apparatus without altering the actual states of said principal circuit points, said secondary apparatus including,

accessing means, connected to said pincipal circuit points, for accessing state information at said one point in time indicating the actual states of said principal circuit points,

subset means for causing said state information from said accessing means to include the actual states of only a

subset of said principal circuit points, said subset means including a memory for storing identification values for identifying said subset of said principal circuit points, and including means for selecting said data information to include the actual states of said subset of principal circuit points identified in said memory,

generator means connected to receive said state information from said subset means for generating an actual



checksum having a value dependent upon the actual states of said subset of said principal circuit points, and means for storing an expected checksum having a value determined by the expected states at said one point in time of said subset of said principal circuit points whereby the expected checksum can be compared with the actual checksum for detecting faults in the principal apparatus.

4,142,244

PROGRAMMABLE ELECTRONIC COMPUTER

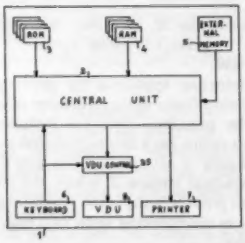
Gastone Garziera, Ivrea (Turin), and Federico Pisani, Scarmagno, (Turin) both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 4, 1977, Ser. No. 784,424

Claims priority, application Italy, Apr. 15, 1976, 67898 A/76

Int. Cl.[2] G06F *3/02, 3/14*

U.S. Cl. 364—900 **7 Claims**



1. In a programmable electronic computer comprising a working memory, a central unit performing a processing operation in executing programs recorded in the working memory, a first timing circuit for timing said processing operation of the central unit in execution of said programs, a keyboard comprising control keys and character keys for introducing keyboard information to be processed into an input zone of said working memory, a visual display unit for displaying a message sent by the central unit to a message zone of the working memory, and a display control unit for controling said visual display unit comprising:

a supply memory controlled by said central unit to supply said message or said keyboard information to the visual display unit; and,

a second timing circuit for timing said display control unit and said supply memory independent of the timing of said central unit by said first timing circuit;

said electronic computer further comprising:

signalling means in the central unit for signalling the presence in said message zone of a message sent by the central unit to be displayed;

switching means conditionable for selectively connecting the supply memory to said input zone or to said message zone of the working memory; and

manual means being operable to condition said switching means, whereby said visual display unit can selectively display said message or said keyboard information during said processing operation of the central unit.

4,142,245

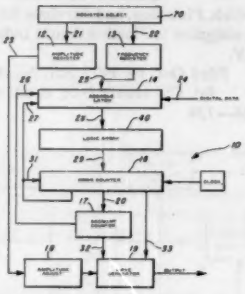
MULTI-FREQUENCY DIGITAL WAVE SYNTHESIZER FOR PROVIDING ANALOG OUTPUT SIGNALS

Robert P. Baron, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 22, 1977, Ser. No. 826,484

Int. Cl.[2] G06F *1/02;* G06G *7/26*

U.S. Cl. 364—900 **46 Claims**



1. A multi-frequency digital wave synthesizer, including a system clock, for providing one of a plurality of analog output signals made up of n successive segments wherein n is an integer greater than one, in response to a corresponding electrical digital signal input, comprising:

(a) logic array means for storing and providing a binary representation of the period of a selected segment of any of the plurality of output signals;

(b) addressing means operatively connected to receive a binary identification of a selected segment, to the logic array means and to the digital signal input for addressing a selected segment, whereby the logic array means provides a binary representation of the period of the selected segment;

(c) segment period determining means, operatively connected to the output of the logic array means and responsive to the binary representation for providing in real time the period of the selected segment;

(d) segment selecting means connected to receive and responsive to the output of the segment period determining means, for successively providing a binary identification of each of the n segments, having output means operatively connected to the addressing means; and

(e) wave generator means, operatively connected to the output means of the segment selecting means for identifying the segment and to the output of the segment period determining means for providing the real time period, for

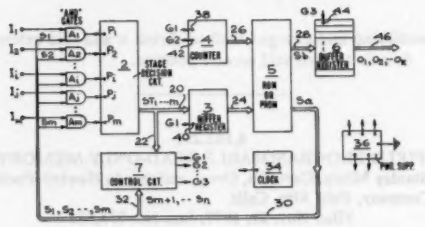
selectively providing a predetermined voltage corresponding to the selected segment period, successively, for each of the n segments thereby forming one of the plurality of analog output signals.

4,142,246

SEQUENCE CONTROLLER WITH DYNAMICALLY CHANGEABLE PROGRAM

Takezoe Fumihiko, and Shigeru Omori, both of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,827
Claims priority, application Japan, Dec. 23, 1976, 51/15556
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—900 **8 Claims**



1. For use in a process control system having processing apparatus to be sequenced, a sequence controller with a dynamically changeable sequencing program, including:

a plurality of process-signal input terminals adapted for connection to selected and respective condition indicators in said process control system;

an equal plurality of AND gates, each having a signal pin, a gating pin and an output pin, each of said process signal input terminals being connected to a respective one of said signal pins of said AND gates, said AND gates each being responsive to the coincidence of a process signal and a "one" gating signal at its signal and gating pins, respectively, to produce a stage-indication signal at its output terminal;

read-only memory means having a plurality of multiple-step storage stages each containing, at each step, output signals comprising sequence control signals and associated binary gating signals, said gating signals being, in number, at least equal to the number of said AND gates, said read-only memory means having stage addressing pins, sequence-control-signal output pins and, in addition, a gating signal output terminal corresponding to each of said binary gating signals, each of said gating signal output terminals of said read-only memory being connected to a respective one of said gating pins of said AND gates;

stage and step addressing and read-out means, including counter means, coupled between said output pins of said AND gates and said stage-addressing pins of said read-only memory and responsive to stage-indication signals from said AND gates for addressing and reading out, selectively, from stages and steps in said read-only memory the sequence control and gating signals contained therein; and,

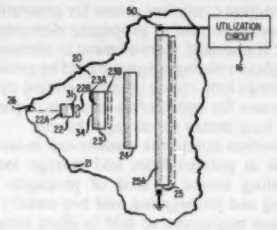
means coupled to said addressing and read-out means for applying said sequence control signals to said processing apparatus.

4,142,247

CONDUCTOR-DRIVEN MAGNETIC BUBBLE MEMORY WITH AN EXPANDER-DETECTOR ARRANGEMENT

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1977, Ser. No. 857,919
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **6 Claims**



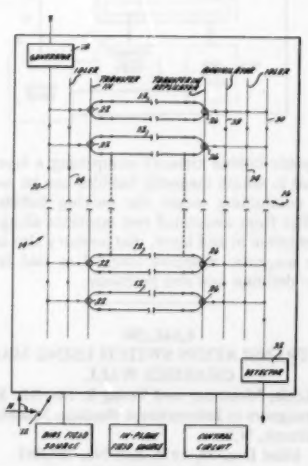
6. A magnetic bubble memory comprising a layer of magnetic material in which magnetic bubbles can be moved, and electrically-conducting means operative to move bubbles to successive first positions in said layer along a path of bubble propagation, and means for defining rest positions for bubbles offset from said first positions, said electrically conducting means comprising an electrically conducting film including a set of apertures therein for defining said path, wherein successive ones of said apertures and associated ones of said rest positions have increasingly longer dimensions lateral to the axis of said path.

4,142,248

ASYNCHRONOUS STORAGE LOOP TYPE BUBBLE CHIP ARCHITECTURE

David M. Baker, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 21, 1977, Ser. No. 853,408
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 **6 Claims**



1. A bubble memory system having an in-plane rotating magnetic field for bubble propagation comprising:

a plurality of storage loop means formed of propagate elements for supporting and propagating bubble domains from element to element responsive to the rotation of said in-plane magnetic field, and having a loop propagation

cycle which depends on the number of elements in each storage loop means with an equal number of elements in each storage loop means, and wherein a bubble or the absence of a bubble constituting bits of binary information circulating in said storage loop means,

a write section and a read section operatively located with respect to said storage loop means for writing bits into said storage loop means and for reading out bits from said storage loop means,

the write section comprises means for generating bits, propagating means formed of propagate elements for propagating said bits serially from element to element responive to said in-plane rotating magnetic field to provide one bit for each storage loop means in one operating cycle, and transfer-in means for transferring said bits in parallel into said storage loop means for storage therein,

the read section comprises transfer-out means for transferring bits in parallel from said storage loop means and propagating means formed of propagate elements for receiving and propagating said bits serially from element to element responsive to said in-plane rotating magnetic field to a detector means for serially detecting bits therein, and

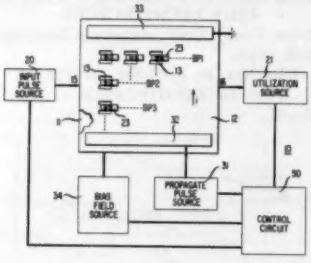
means in said write section and in said read section for providing said sections with an operating cycle independent of the loop propagation cycle so that said section may be operated asynhronously with respect to the loop propagation cycle.

4,142,249

CONDUCTOR-ACCESS, MAGNETIC BUBBLE MEMORY

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1977, Ser. No. 857,920
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—19 **9 Claims**



6. A magnetic bubble memory comprising a layer of magnetic material in which magnetic bubbles can be moved, and electrically conducting means for moving bubbles to first positions offset from associated rest positions along a path of bubble propagation in said layer, said memory also comprising out-of-plane magnetic elements coupled to said layer along said path for defining said rest positions.

4,142,250

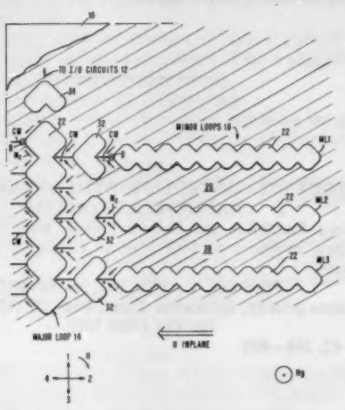
BUBBLE TRANSLATION SWITCH USING MAGNETIC CHARGED WALL

George E. Keefe, Montrose, and Yeong S. Lin, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,897
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—36 **31 Claims**

26. A method for propagating a bubble domain from a first location in a bubble domain medium to a second location in said medium, comprising the steps of:

producing a magnetic charged wall substantially bridging said first and second locations of sufficient intensity along its length to cause said bubble domain to expand along its length from said first position to approximately said second position, and



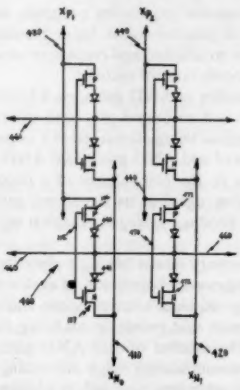
modifying said charged wall to shrink it and said extended domain toward said second position.

4,142,251

FIELD PROGRAMMABLE READ-ONLY-MEMORY

S. Stanley Mintz, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 21, 1977, Ser. No. 853,681
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—181 **4 Claims**



1. A memory circuit comprising:

a first logic element having first and second terminals for providing a conductive path therebetween in response to a charge of a first polarity on a third terminal;

a second logic element having first and second terminals for providing a conductive path therebetween in response to the presence of a charge of a second polarity on a third terminal thereof;

said third terminals of said first and second logic elements being electrically coupled and further being electrically isolated from any other direct electrical contact; and

said first logic element being further coupled to said second logic element through the electrical coupling of said second terminal of said first logic element to the first terminal of said second logic element.

DESIGN PATENTS

GRANTED FEB. 27, 1979

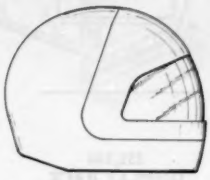
ERRATA

For CLASS	See PATENT NO.
D18–001	251,212

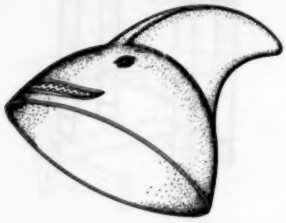
DESIGNS

FEBRUARY 27, 1979

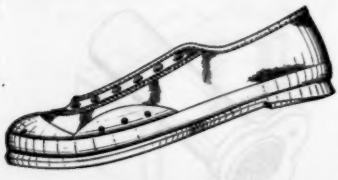
251,156
PROTECTIVE HELMET
Wolfram Schleicher, Imsteiengarten 3, 7000 Stuttgart 80, and Corina Pilch, Gähkopf Nr. 30, 7000 Stuttgart 1, both of Fed. Rep. of Germany
Filed Nov. 17, 1976, Ser. No. 742,561
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 19586
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



251,157
NOVELTY HAT
Glenn L. Walter, 13950 Hesperia Rd., Victorville, Calif. 92392
Filed Mar. 31, 1977, Ser. No. 783,108
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—251

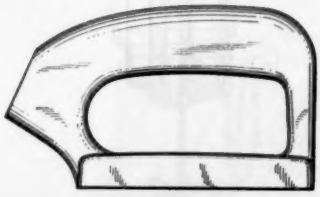


251,158
BIKE SHOE
Thomas A. Edmonds, Abingdon, Md., assignor to Bata Shoe Company, Inc., Belcamp, Md.
Filed Dec. 28, 1976, Ser. No. 755,045
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

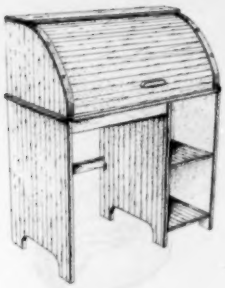


251,159
SHAVING BRUSH ATTACHMENT FOR A SHAVING CREAM CAN
McKinley Tolliver, 3867 Cardinal Blvd., Daytona Beach, Fla. 32019
Filed Oct. 18, 1977, Ser. No. 843,357
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—19

251,160
PAINT BRUSH HANDLE OR THE LIKE
J. Joseph Kelly, III, Boylston, Mass., and Frederick W. Roeder, Hawthorne, N.J., assignors to H & G Industries, Inc., Belleville, N.J.
Filed Nov. 8, 1977, Ser. No. 849,386
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38



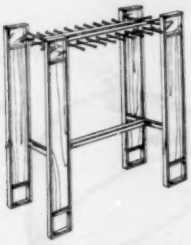
251,161
CHILD'S ROLL-TOP DESK OR SIMILAR ARTICLE
William R. Tomalinas, Jr., Wapwallopen, and Herbert S. Gurbst, Kingston, both of Pa., assignors to Roth American, Inc., Kingston, Pa.
Filed Jun. 3, 1977, Ser. No. 803,421
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—5



251,162
DISPLAY UNIT FOR EYEGLASS FRAMES
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 29, 1977, Ser. No. 865,458
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—29

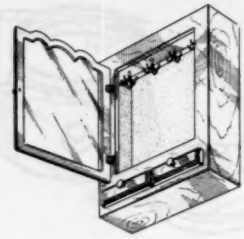
251,163
CHAIR WITH SINGLE ARM REST
Ambrogio Busnelli, Milan, Italy, assignor to B & B Italia S.p.A., Milan, Italy
Filed Aug. 23, 1976, Ser. No. 716,815
Claims priority, application Italy, Mar. 12, 1976, 20941/76[U]
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

251,164
DISPLAY RACK
Louis Rosen, 100 Villeneuve St. W., Montreal, Quebec, Canada (H2T 1L2)
Filed Feb. 23, 1977, Ser. No. 771,388
Claims priority, application Canada, Oct. 5, 1976, 0510763
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

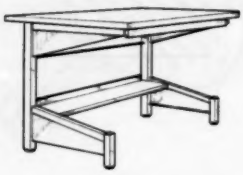


251,165
TELESCOPIC CLOTHES HANGER
Alvin R. Moody, P.O. Box 137, Hackett, Ark. 72937
Filed Feb. 17, 1978, Ser. No. 878,936
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—124

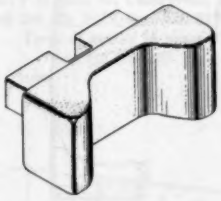
251,166
WALL CABINET FOR JEWELRY OR THE LIKE
Mildred I. McIntosh, 6218 Flamingo, Buena Park, Calif. 90620
Filed Dec. 27, 1976, Ser. No. 754,828
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129



251,167
WORKBENCH
Ronald E. Isles, 1161 Steele Dr., Brea, Calif. 92621
Filed Jan. 28, 1977, Ser. No. 763,361
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



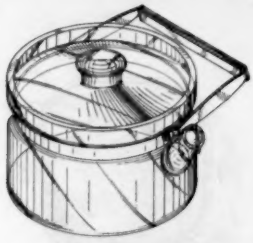
251,168
AUTO HEADREST
R. V. Otis Perkey, 1310 SE. 30th Ave., Ocala, Fla. 32670
Filed Aug. 3, 1977, Ser. No. 821,583
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—200

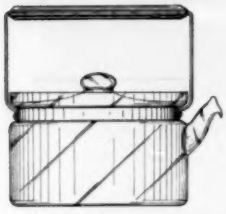


251,169
FOOD WASHING BOWL
Taiichi Ono, 88, 4-chome, Biwajima-dori, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Jul. 6, 1976, Ser. No. 702,456
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1

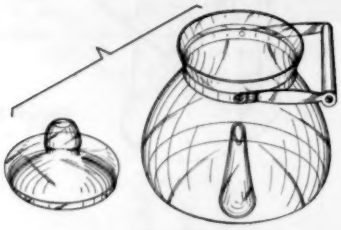
251,170
TEA KETTLE OR SIMILAR ARTICLE
Peter D. Kamenstein, Armonk, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jun. 23, 1978, Ser. No. 918,613
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—66

251,171
TEA KETTLE OR SIMILAR ARTICLE
Martin Umanoff, Great Neck, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jun. 23, 1978, Ser. No. 918,621
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—66

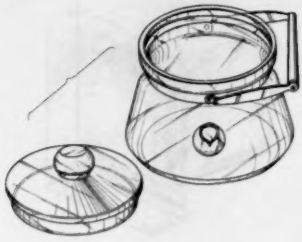




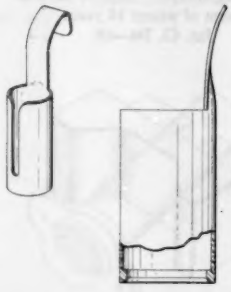
251,172
TEA KETTLE OR SIMILAR ARTICLE
Peter D. Kamenstein, Armonk, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jun. 23, 1978, Ser. No. 918,739
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—66



251,173
TEA KETTLE OR SIMILAR ARTICLE
Martin Umanoff, Great Neck, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jun. 23, 1978, Ser. No. 919,525
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—66



251,174
VACUUM BOTTLE HOLDER
Lester Biever, 219 N. 6th St., Greybull, Wyo. 82426
Filed Nov. 1, 1976, Ser. No. 737,655
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70



251,175

DETACHABLE HANDLE FOR A BEVERAGE CAN

Thomas D. Logan, 3740 Dover Pl., Los Angeles, Calif. 90039, and Edwin S. Nelson, 140 S. Buena Vista St. Apt. V, Burbank, Calif. 91505

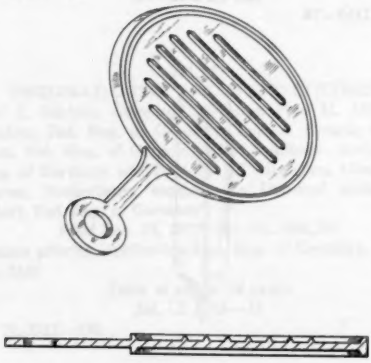
Filed Mar. 30, 1977, Ser. No. 782,721
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

251,176

REVERSIBLE BAKING DISH

Barbara Lewis, 849 Ocean Ave., Point Richmond, Calif. 94801

Filed Mar. 11, 1977, Ser. No. 776,600
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D7—87



251,177

GRASS CUTTER DEVICE

James A. Sinclair, P.O. Box 83, Centreville, La. 70522

Filed Jul. 20, 1977, Ser. No. 817,381
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—12

251,178

KITCHEN SCISSORS

Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Osaka, Japan

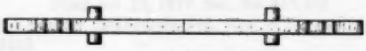
Filed Jan. 12, 1977, Ser. No. 758,755
Claims priority, application Japan, Jun. 17, 1976, 51-023179
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

251,179

PARKING CURB REINFORCING BAR SUPPORT

Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries, Ltd., Plainview, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,933
Term of patent 7 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

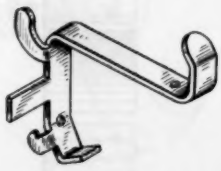


251,180

DISPLAY HOOK

William G. Mader, York, and Kenneth J. Taggart, Willow Street, both of Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.

Filed May 19, 1977, Ser. No. 798,437
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



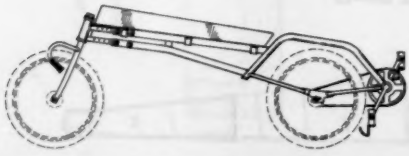
251,181
BOTTLE
John D. Angleman, Brookside, N.J., and Doris du Cret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Continuation-in-part of Ser. No. 659,755, Jan. 9, 1975, Pat. No. Des. 240,711. This application Jul. 26, 1976, Ser. No. 708,826
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83

251,182
BOTTLE
John D. Angleman, Brookside, N.J., and Dor[illegible] du Cret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Division of Ser. No. 708,826, Jul. 26, 1976. This application Jun. 19, 1978, Ser. No. 916,448
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83

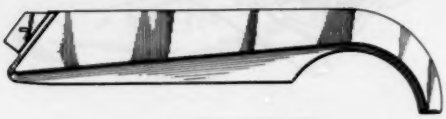
251,183
ELECTRICAL TESTING INSTRUMENT
James L. Howard, Lancaster, S.C., assignor to Earl Cooper Phifer, a part interest
Filed Apr. 8, 1977, Ser. No. 785,929
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75

251,184
CHARGING SYSTEM ANALYZER
Richard G. Volk, York, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.
Filed Jan. 26, 1977, Ser. No. 762,400
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

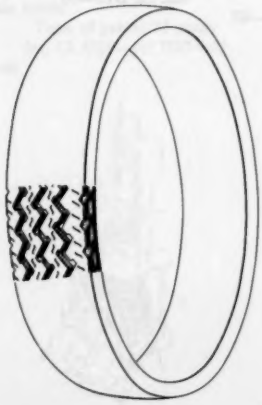
251,185
BICYCLE FRAME
Darold B. Cummings, 808 McCarthy Ct., El Segundo, Calif. 90245
Filed Jun. 17, 1977, Ser. No. 807,360
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



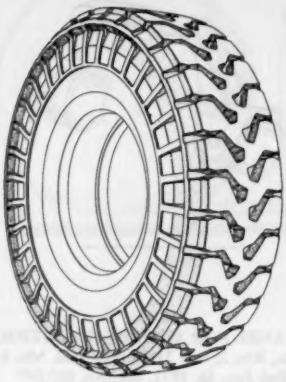
251,186
BICYCLE CHAIN GUARD
Dennis C. Patterson, Nashville, and Donald W. Payne, Spring Hill, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Feb. 25, 1977, Ser. No. 772,236
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—127



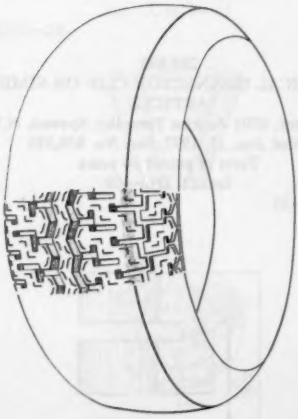
251,187
PNEUMATIC TIRE TREAD AND BUTTRESS
Henri J. Mirtain, Compiegne, France; Paul H. Moitzheim, Aachen, Fed. Rep. of Germany; Karl A. Grosch, Roetgen, Rott, Fed. Rep. of Germany; Gert Schlösser, Aachen, Fed. Rep. of Germany, and Daniel J. M. Hensgens, Ubach-Overworms, Netherlands, assignors to Uniroyal Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 15, 1977, Ser. No. 806,786
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1977, 3161
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



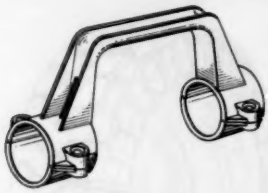
251,188
TIRE
Jean Pommier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jul. 11, 1977, Ser. No. 814,790
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



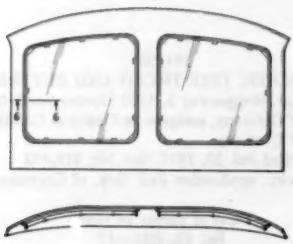
251,189
PNEUMATIC TIRE TREAD AND BUTTRESS
Hans J. Voegler, Roggenweg 6, 5120 Herzogenrath-Merkstein, Fed. Rep. of Germany, assignor to Uniroyal GmbH, Aachen, Fed. Rep. of Germany
Filed Jul. 27, 1977, Ser. No. 819,433
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 3163
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



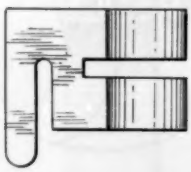
251,190
GRAB BAR FOR RECREATIONAL VEHICLES
Arthur L. Peterson, 2679 Kents Rd., Thousand Oaks, Calif. 91360
Filed May 19, 1977, Ser. No. 798,395
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



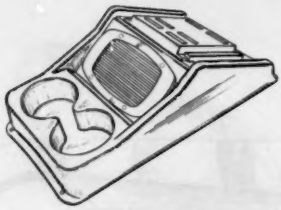
251,191
ROOF PANEL FOR AUTOMOTIVE VEHICLES
Michael D. Dix, Rte. 2, Box 316, Cedar Hill, Mo. 63016
Filed Jun. 16, 1977, Ser. No. 807,047
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



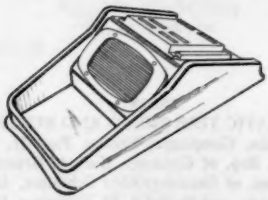
251,192
ELECTRICAL CONNECTOR CLIP OR SIMILAR ARTICLE
Paul V. De Luca, 6901 Jericho Turnpike, Syosset, N.Y. 11791
Filed Jun. 22, 1977, Ser. No. 808,890
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



251,193
AUXILIARY LOUDSPEAKER UNIT FOR AUTOMOTIVE USE
Roy M. Neece, Rte. 9, Box 289V, Saginaw, Tex. 76179
Filed Apr. 11, 1977, Ser. No. 786,354
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

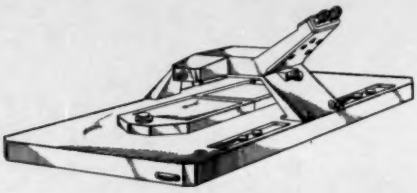


251,194
AUXILIARY LOUDSPEAKER UNIT FOR AUTOMOTIVE USE
Roy M. Neece, Rte. 9, Box 289V, Saginaw, Tex. 76179
Filed Apr. 11, 1977, Ser. No. 786,355
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



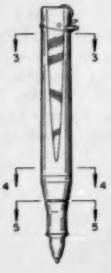
251,195
SPINNING WHEEL
Doloria M. Chapin, 2178 Pompey-Fabius Rd. - R.D. 1, Fabius, N.Y. 13063
Filed Aug. 17, 1976, Ser. No. 715,185
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—67

251,196
PORTABLE NUMERICAL STEREO COMPILER OR THE LIKE
H. Dell Foster, San Antonia, Tex., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed May 10, 1977, Ser. No. 795,573
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48

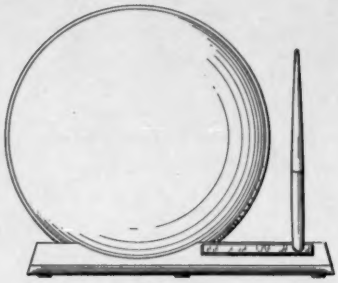


251,197
FOCUSING KNOB FOR BINOCULARS
Masashi Kobayashi, Tokyo, Japan, assignor to Osawa & Co. (USA) Inc., New York, N.Y.
Filed Mar. 17, 1978, Ser. No. 887,523
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59

251,198
COMBINED PEN AND LIGHTER
John S. Horvath, Carriage, La., Apt. Bldg. 202, Apt. 201, Canfield, Ohio 44406
Term of patent 14 years
Int. Cl. D19—*06*; D27—*05*
U.S. Cl. D19—36



251,199
COMBINED DESK PEN SET AND PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 18, 1977, Ser. No. 788,651
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



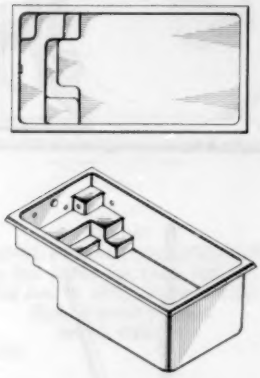
251,200
HANDLE FOR A FAUCET
Victor R. Hart, 156 Camden High St., London NW1 ONE, England
Filed May 31, 1977, Ser. No. 802,287
Claims priority, application United Kingdom, Dec. 10, 1976, 978208
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

251,201

COMBINATION SWIMMING EXERCISE AND THERAPEUTIC POOL

Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Filed Mar. 15, 1977, Ser. No. 777,614
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



251,202

INVALID'S TREATMENT BASIN

Beatrice M. Charewicz, 28 Longview St., Lanesboro, Mass. 01237

Filed Feb. 10, 1977, Ser. No. 767,304
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56

251,203

APPLICATOR FOR MEDICAMENTS OR THE LIKE

Vere A. Williamson, 42 Oxford Rd., Strathfield, New South Wales, Australia (2135)

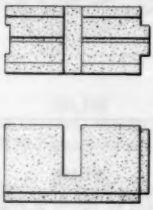
Filed Dec. 27, 1977, Ser. No. 864,642
Claims priority, application Australia, Aug. 12, 1977, 72541
Term of patent 14 years
Int. Cl. D24—*04;* D9—*01*
U.S. Cl. D24—63

251,204

BUILDING CONSTRUCTION BLOCK

Carmine J. Ceglia, 18 Eliott St., Norwood, Mass. 02062

Filed Apr. 27, 1977, Ser. No. 791,633
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



251,205

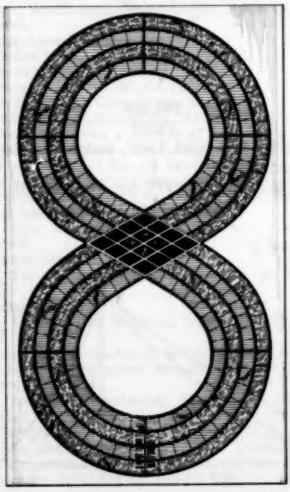
HAIR STYLER

Rayko Ergaver, and Nevenka Ergaver, both of Toronto, Canada, assignors to Capella Inc., Freeport, The Bahamas

Filed Apr. 28, 1978, Ser. No. 900,957
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

251,206
COMBINED AQUARIUM AND BIRD CAGE
Robert J. Conrad, 905 NE. 17th Ct. Apt. 3, Fort Lauderdale, Fla. 33306
Filed Jun. 13, 1977, Ser. No. 806,008
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11

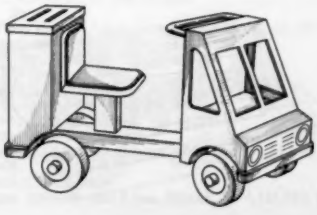
251,207
GAME BOARD
William E. Morris, Appleton, Wis., assignor to Super-Games, Inc., Green Bay, Wis.
Filed Aug. 12, 1976, Ser. No. 714,081
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



251,208
TOY VEHICLE
Fredric C. Behling, 41 Washington St., West Barrington, R.I. 02890, and Paul J. Sullivan, 300 Metacom Ave., Bristol, R.I. 02809
Filed Oct. 18, 1976, Ser. No. 733,466
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

251,209
TOY HOUSE
William D. Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.
Filed Dec. 27, 1976, Ser. No. 754,591
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

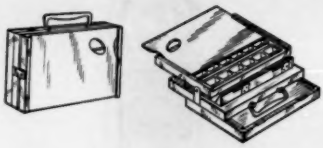
251,210
TOY VEHICLE
Howard J. Morrison, Deerfield, and Palmer J. Schoenfield, Evanston, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 21, 1977, Ser. No. 761,391
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



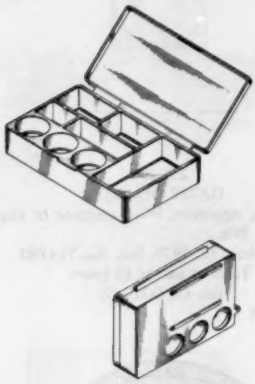
251,211
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Aug. 26, 1976, Ser. No. 717,564
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

251,212
PORTABLE TYPEWRITING MACHINE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed May 25, 1976, Ser. No. 689,917
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

251,213
COMBINED SKETCH CASE AND PALETTE FOR WATER COLORS
Viktor P. Rodin, Moscow; Petr S. Zhdanov, and Jury I. Prokhorov, both of Podolsk Moskovskoi, all of U.S.S.R., assignors to Proizvodstvenny Kombinat Khudozhestvennogo Fonda, U.S.S.R.
Filed Dec. 10, 1976, Ser. No. 749,527
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



251,214
GOLF ACCESSORY BOX
James W. Coleman, 8547 Lehigh St., Sun Valley, Calif. 91352, and Wilbur G. Hale, 8030 Hesperia St., Reseda, Calif. 91335
Filed May 12, 1977, Ser. No. 796,203
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



251,215
TENT
George R. Marks, Richmond, Calif., assignor to Sierra Designs, Inc., Oakland, Calif.
Filed Apr. 25, 1977, Ser. No. 790,835
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF FEBRUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. & T. Development Corporation: *See*—
Grosse, Aristid V., 4,141,798, Cl. 202-234.000.

A-T-O Inc.: *See*—
Ulch, Bryan D., 4,142,097, Cl. 235-382.000.

Aagard, Roger L.; and Ulmer, Robert P., to Honeywell Inc. Three layer waveguide for thin film lens fabrication. 4,141,621, Cl. 350-96.120.

Aarons, Raymond J., to Monier Colourtile Pty. Ltd. Tile clip. 4,141,191, Cl. 52-715.000.

AB Calator: *See*—
Johansson, Nils L., 4,141,131, Cl. 29-428.000.

AB Electrolux: *See*—
Hallerback, Stig L., 4,142,120, Cl. 310-59.000.

Abbott Laboratories: *See*—
Becker, Frank C.; and Li, Jorge P., 4,141,905, Cl. 260-326.5FM.
Raden, Daniel S.; Weiner, Morton A.; and Hill, Douglas W., 4,141,862, Cl. 521-129.000.

Abdo, Milton K., to Mobil Oil Corporation. Waterflood oil recovery process employing stabilized biopolymers. 4,141,842, Cl. 252-8.55D.

Abel, Eugene K.; and Shupp, Jack K., to Flinchbaugh Products, Inc. Method and apparatus for cutting circumferential grooves on the interior of a workpiece. 4,141,279, Cl. 90-11.00C.

Abraham, John K.; and Varder Arend, Peter J., to Republic Steel Corporation. High strength low alloy steel containing columbium and titanium. 4,141,761, Cl. 148-36.000.

Abraham, Tonson: *See*—
Evers, Robert C.; and Abraham, Tonson, 4,142,037, Cl. 528-210.000.

Abrams, Charlie F., Jr.: *See*—
Morrison, John E., Jr.; and Abrams, Charlie F., Jr., 4,141,302, Cl. 111-52.000.

Abrams, Donald W., to General Electric Company. Refrigerator cabinet case heater installation. 4,142,092, Cl. 219-218.000.

Absenger, Erich: *See*—
Hatz, Ernst; and Absenger, Erich, 4,141,334, Cl. 123-198.00E.

ACF Industries, Incorporated: *See*—
Dye, Silas O., 4,141,940, Cl. 261-23.00A.
Reedy, Charles E.; and Carlson, Edwin S., 4,141,535, Cl. 251-144.000.
Tipton, Larry J.; and Bryant, Steven D., 4,141,328, Cl. 123-138.000.

Ackeret, Peter, to Zyliss Zysset AG. Hand utensil for holding a citrus fruit. 4,141,541, Cl. 269-6.000.

Acme Marls Limited: *See*—
Lovatt, William J., 4,141,681, Cl. 432-258.000.

Adachi, Fumiyuki, to Nippon Telegraph and Telephone Public Corporation. Diversity system. 4,142,155, Cl. 325-47.000.

Adachi, Kouji. Electronic cradle. 4,141,095, Cl. 5-108.000.

Adams, John, Sr. Vented helmet and face shield. 4,141,085, Cl. 2-410.000.

Adams Rite Products, Inc.: *See*—
Beijer, Gene; Smith, James S.; and Sheffer, Ralph L., 4,141,520, Cl. 244-83.00A.

Adaptive Optics Associates, Inc.: *See*—
Feinleib, Julius M., 4,141,652, Cl. 356-121.000.

Addison Products Company: *See*—
Bergen, Bernard J., 4,141,337, Cl. 126-270.000.

Addressograph-Multigraph Corporation: *See*—
Roberts, William E., 4,141,640, Cl. 354-300.000.

Adirondack Steel Specialties, a division of Adirondack Steel Casting Co., Inc.: *See*—
Francis, Terry M., 4,141,512, Cl. 241-194.000.

Adler, Arnold S., to Ciba-Geigy Corporation. Process for the production of 2-aryl-2H-benzotriazoles. 4,141,903, Cl. 260-308.00B.

Advance Valve Installations Inc.: *See*—
Wegner, John W.; and Porter, Herbert L., 4,141,378, Cl. 137-315.000.

Advanced Mineral Research AB: *See*—
Kihlstedt, Per G.; and Hassler, Hedvig E. B., 4,141,698, Cl. 55-6.000.

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Dahlback, Gunnar; and Hellquist, Ivan A., 4,141,353, Cl. 128-142.00R.

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Ory, Jean-Marie; and Hummer, Jacques, 4,141,349, Cl. 128-2.00S.

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Schnall, Gunther; Aldenhoven, Klaus; and Blochl, Hanns, 4,141,545, Cl. 271-118.000.
Schnall, Gunther; and Blochl, Hanns, 4,141,649, Cl. 355-51.000.

Agneus, Nils-Erik; and Mansson, Hans-Eric, to Telefonaktiebolaget L M Ericsson. Temperature-stable electret microphone with embossed, small area, electret. 4,142,073, Cl. 179-111.00E.

Agulnek, Harry: *See*—
Mishcon, Lester, deceased; and Agulnek, Harry, 4,141,227, Cl. 66-229.000.

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Zijlstra, Jan G. H., 4,141,384, Cl. 137-883.000.

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Wonderling, Harold J., 4,141,128, Cl. 29-163.50F.

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Dixon, Dale D.; and Ford, Michael E., 4,142,021, Cl. 428-412.000.

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Norton, Wilson L., Jr.; and Risse, Willis H., 4,141,700, Cl. 55-337.000.

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Okada, Ryohei, 4,141,307, Cl. 112-292.000.
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Aitchison, Gordon F.; and Mattock, Patrick, to United Kingdom Atomic Energy Authority. Separation process. 4,141,809, Cl. 204-180.00R.

Ajot, Hubert: *See*—
Courty, Philippe; Ajot, Hubert; and Delmon, Bernard, 4,141,861, Cl. 252-462.000.

Akiyama, Takayuki, to Foseco Trading A.G. Thermit compositions. 4,141,769, Cl. 149-40.000.

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Lempke, George D.; and Hakanson, Nils L., 4,141,647, Cl. 355-10.000.

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Albanese, Vincent M., to Nalco Chemical Company. Alkaline treated molecular sieves to increase collection efficiency of electrostatic precipitator. 4,141,697, Cl. 55-5.000.

Albany International Corporation: *See*—
Romanski, Eric R.; and Josef, Michael J., 4,141,388, Cl. 139-383.00A.

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Bornor, June R., 4,141,539, Cl. 266-78.000.

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Harman, Julius; and Norman, Michael E., 4,141,281, Cl. 91-216.00R.

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Wu, Ching H.; Brown, Alfred; Konopnicki, Daniel T.; and Allen, Joseph C., 4,141,415, Cl. 166-252.000.

Allen, Terry S.: *See*—
Jacobson, Peter E.; and Allen, Terry S., 4,141,139, Cl. 29-755.000.

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Torrani, Roberto, 4,142,084, Cl. 219-60.00A.

Allis-Chalmers Corporation: *See*—
Williams, Douglas W., 4,141,434, Cl. 184-6.120.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,141,760, Cl. 148-31.500.

Amdahl Corporation: *See*—
Bishop, Richard L.; and Gibson, William A., 4,142,243, Cl. 364-900.000.

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Schwartzman, Sanford; and Lima, Daniel A., 4,141,913, Cl. 260-453.00P.

American Color & Chemical Corporation: *See*—
Renfrew, Edgar E.; and Smith, Roy E., 4,141,892, Cl. 260-186.000.
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Coscia, Anthony T.; and O'Connor, Michael N. D., 4,141,827, Cl. 210-54.000.
Grudzinskas, Charles V.; and Weiss, Martin J., 4,141,914, Cl. 260-464.000.
Lang, Stanley A., Jr.; Lin, Yang-I; Fields, Thomas L.; Fabio, Paul F.; and Murdock, Keith C., 4,141,992, Cl. 424-326.000.
American Home Products Corporation: *See*—
Sejpal, Vasant D., 4,142,003, Cl. 426-601.000.
American Optical Corporation: *See*—
Siegmund, Walter P., 4,141,624, Cl. 350-96.260.
Travnicek, Edward A., 4,141,941, Cl. 264-1.000.
Amin, Sanjay I.; and Walker, Jerry A., to Upjohn Company, The. Process for preparing arylalkanoic acid derivatives. 4,142,054, Cl. 560-105.000.
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AMP Incorporated: *See*—
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; and Vachhani, Vasantrai A., 4,141,618, Cl. 339-97.00P.
An, Jung B. Method of collecting oil from crude oil residue. 4,141,818, Cl. 208-177.000.
Analogic Corporation: *See*—
Gordon, Bernard M., 4,142,185, Cl. 340-347.0AD.
Analytical Instrument Specialties, Inc.: *See*—
Cummins, Judith G., 4,141,833, Cl. 210-198.00C.
Anami, Takayuki: *See*—
Yamazaki, Masaru; Okusho, Susumu; and Anami, Takayuki, 4,142,214, Cl. 358-257.000.
Andeen, Gerry B.: *See*—
Treyti, William J.; Slemmons, Arthur J.; and Andeen, Gerry B., 4,141,626, Cl. 350-295.000.
Anderson, Arthur A., to Specialty Manufacturing Company. Central flow nozzle selector. 4,141,504, Cl. 239-394.000.
Anderson, Gerald R.: *See*—
Taylor, David C.; and Anderson, Gerald R., 4,141,276, Cl. 89-11.000.
Anderson, James B. Process for separating gas mixtures, especially isotopes. 4,141,699, Cl. 55-17.000.
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Anderson, Robert D., to Trelleborg Rubber Company, Inc. Mill lining elements. 4,141,511, Cl. 241-183.000.
Anderson, Russell L., to Avtex Fibers Inc. Tray support for shipping wound material packages. 4,141,447, Cl. 206-392.000.
Anderssen, Tore; and Larsen, Kjell, to Elkem-Spigerverket A/S. Method of disposing of precipitated silica. 4,141,945, Cl. 264-63.000.
Andersson, Bror H.: *See*—
Knipstrom, Karl-Erik, Malm, Anders L.; and Andersson, Bror H., 4,142,085, Cl. 219-61.000.
Ando, Ken; Kamosaki, Minoru; Ohya, Yoshinobu; and Asai, Sigeru, to Daicel Ltd. Hot-melt adhesive composition and process employing same. 4,141,774, Cl. 156-309.000.
Ando, Kunio; Hirota, Ryoichi; Osakabe, Kuniharu; and Maruyama, Koichi, to Hitachi, Ltd. Color picture tube. 4,142,131, Cl. 315-368.000.
Ando, Shoichiro. Show case. 4,141,610, Cl. 312-114.000.
Andrews, Peter: *See*—
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, 4,141,978, Cl. 424-250.000.
Aneja, Rajindra; Davies, Alan P.; and Keith, Maxwell C., to Internationale Octooimaatschappij "Octropa" B.V. Method for pigmenting fish flesh. 4,141,994, Cl. 424-331.000.
Anstadt, Gerd L.; and Kesseler, Helmut, to Gebruder Kommerling Kunststoffwerke G.m.b.H. Process for the production of imitation wood from synthetic resins. 4,141,944, Cl. 264-45.500.
Anthony, Thomas R.: *See*—
Cline, Harvey E.; and Anthony, Thomas R., 4,141,757, Cl. 148-1.500.
Antonetti, Joseph M.; and Snow, Glen F., to Calgon Corporation. Use of water soluble polymers in coal flotation circuits. 4,141,691, Cl. 44-1.00R.
Antos, George J., to UOP Inc. Dehydrocyclization process. 4,141,923, Cl. 260-673.500.
Aoki, Akiji: *See*—
Kanai, Tadashi; Maruyama, Osamu; and Aoki, Akiji, 4,142,041, Cl. 536-23.000.
Aoki, Yutaka; Hase, Akira; Ito, Jiro; and Nagai, Hisomu, to Nissho-Iwai Co., Ltd. Process for preparation of coke and carbonizer therefor. 4,141,793, Cl. 201-6.000.
Aonuma, Masashi; Tamai, Yasuo; Kitamoto, Tatsuji; and Kodama, Fumio, to Fuji Photo Film Co., Ltd. Process for production of ferromagnetic powder and apparatus therefor. 4,141,763, Cl. 148-105.000.
Apple, Wayne R. Apparatus for automatic ventilation of the lungs. 4,141,355, Cl. 128-145.600.
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Applefield, Jerome: *See*—
Rech, Jakob, 4,141,476, Cl. 222-505.000.
Applefield, Sheldon H.: *See*—
Rech, Jakob, 4,141,476, Cl. 222-505.000.
Arai, Naoki: *See*—
Minagawa, Yoshisato; Arai, Naoki; and Ueda, Takehiko, 4,141,730, Cl. 96-9.000.
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, to Societa' Farmaceutici Italia S.p.A. 4,5,6,7-Tetrahydroimidazo-[4,5-c]-pyridine derivatives. 4,141,899, Cl. 546-118.000.
Arce, Luis A., to G. L. Collins Corporation. High voltage A.C. test set for measuring true leakage current. 4,142,142, Cl. 324-54.000.
Argenti, Benito: *See*—
Martini, Alessandro; Federici, Federico; and Argenti, Benito, 4,141,791, Cl. 195-66.00R.
Ariga, Kinji; and Gomyo, Shiro, to Shin-Etsu Chemical Co., Ltd. Method for preparing epoxy-modified silicon resins. 4,141,926, Cl. 260-824.0EP.
Armco Inc.: *See*—
Stoops, Reginald B.; and Maxel, John M., 4,141,929, Cl. 260-862.000.
Armstrong Cork Company: *See*—
Lampe, John G.; and Whitley, Paul W., 4,142,007, Cl. 428-165.000.
Arnold, Eugene W.; Brock, Gregory K.; and Halley, David G., to Weyerhaeuser Company. Optical electronic seed sowing system. 4,141,390, Cl. 141-9.000.
Arnold, Frederick A. Spectrographic apparatus. 4,141,653, Cl. 356-419.000.
Arnoux, Daniel, to Manufacture Francaise d'Appareils Electriques de Mesures dite Manumesure. Armature assembly for an electromagnetic relay. 4,142,166, Cl. 335-81.000.
Arp, Ewald A. Container and apparatus having a sensor for return deposit payout of such container. 4,141,493, Cl. 235-448.000.
Arthur D. Little, Inc.: *See*—
Prior, William L.; and Lindstrom, Richard S., 4,141,744, Cl. 106-105.000.
Arzi, Allan H. Log splitter. 4,141,395, Cl. 144-193.00R.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,141,633, Cl. 354-24.000.
Asai, Sigeru: *See*—
Ando, Ken; Kamosaki, Minoru; Ohya, Yoshinobu; and Asai, Sigeru, 4,141,774, Cl. 156-309.000.
Asano, Seiji; and Hosono, Tsutomu, to Fuji Photo Optical Co., Ltd. Means for controlling film drive in cameras. 4,141,635, Cl. 354-173.000.
Asano, Toyohide; and Honda, Masahiro, to UBE Industries, Ltd. Stretching machine. 4,141,679, Cl. 425-445.000.
Ascani, Leonard A.: *See*—
Hamilton, C. Howard; and Ascani, Leonard A., 4,141,484, Cl. 228-265.000.
Askew, Herbert F.; Harrington, Colin J.; and Jayne, Gerald J. J., to Castrol Limited. Silane derivatives. 4,141,851, Cl. 252-78.300.
Askew, Herbert F.: *See*—
Jayne, Gerald J. J.; and Askew, Herbert F., 4,141,846, Cl. 252-48.200.
Aspro, Inc.: *See*—
Eddy, William C., Jr., 4,141,430, Cl. 180-105.00E.
Astra Lakemedel Aktiebolaget: *See*—
Carnmalm, Bernt S. E.; Lindberg, Ulf H. A.; De Paulis, Tomas; Ross, Svante B.; Stjernstrom, Nils-Erik; Ulff, Carl B. J.; and Ogren, Sven-Ove, 4,141,993, Cl. 424-330.000.
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Atlantic Richfield Company: *See*—
Yerkes, John W.; and Avery, James E., 4,141,811, Cl. 204-192.00E.
Atlas Copco Aktiebolag: *See*—
Lavon, Erik V., 4,141,592, Cl. 299-16.000.
Auge, Wolfgang: *See*—
Thelen, Bernd; Brandt, Hans-Walter; Auge, Wolfgang; and Thiem, Karl-Werner, 4,141,799, Cl. 203-48.000.
Augustijn, Govert J. P.; and Beun, Jacobus H., to Lever Brothers Company. Fluid driven liquid dosing apparatus. 4,141,467, Cl. 222-38.000.
Augustine, Pius. Door brace for facilitating hanging. 4,141,192, Cl. 52-749.000.
Aulich, Hubert; Pink, Hans; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Method for producing light conducting fibers. 4,141,710, Cl. 65-3.00A.
Austin, Benjamin. Music learning aid. 4,141,273, Cl. 84-484.000.
Austin Powder Company: *See*—
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,141,296, Cl. 102-24.00R.
Authier, Bernhard; Rath, Heinz J.; Schmidt, Dietrich; and Hofer, Johann, to Wacker Chemitronic Gesellschaft fur Elektronik-Grundstroffe mbH. Process for the manufacture of silicon of large surface area bonded to a substrate and silicon-bonded substrates so made. 4,141,764, Cl. 148-174.000.
Auto Specialites Manufacturing Company: *See*—
Wolf, Peter, 4,141,284, Cl. 91-532.000.
Avco Corporation: *See*—
DeBolt, Harold E., 4,142,008, Cl. 427-249.000.
Koschier, Angelo F., 4,141,212, Cl. 60-39.16R.
Avedesian, Michael M.; and Holko, Anthony P., to Noranda Mines Limited. Process for electrowinning metal from metal bearing solutions. 4,141,804, Cl. 204-105.00R.
Avery, James E.: *See*—
Yerkes, John W.; and Avery, James E., 4,141,811, Cl. 204-192.00E.

Avtex Fibers Inc.: *See—*
Anderson, Russell L., 4,141,447, Cl. 206-392.000.
AVX Corporation: *See—*
Dietz, Raymond L., 4,142,203, Cl. 357-80.000.
Awano, Seiichi; and Nishimura, Matsuo, to Seiichi Awano and Yasui Sangyo Co., Ltd. Hot-water boiler of the direct-heating type. 4,141,343, Cl. 126-360.00A.
B. F. Goodrich Company, The: *See—*
Witenhafer, Donald E., 4,142,033, Cl. 526-62.000.
Babler, Fridolin, to Ciba-Geigy Corporation. Process for dyeing linear polyesters in the melt. 4,141,881, Cl. 260-40.00P.
Bacharach Instrument Company, a division of AMBAC Industries, Inc.: *See—*
Van Tassel, Norman L.; and Lang, Vladimir, 4,141,243, Cl. 73-119.00A.
Bachman, Albert J., to DeLaval Turbine Inc. Float-level switch with lifting mechanism. 4,142,079, Cl. 200-84.00C.
Back, Gerhard: *See—*
Hegar, Gert; and Back, Gerhard, 4,141,890, Cl. 260-153.000.
Bahr, Hermann: *See—*
Lattrell, Rudolf; Kief, Heinrich; and Bahr, Hermann, 4,141,991, Cl. 424-295.000.
Baird, George C., to Seismograph Service Corporation. Determination of firing times of acoustic pulses. 4,141,431, Cl. 181-118.000.
Bajka, Lech: *See—*
Gierek, Adam; Bajka, Lech; and Machnicka, Malgorzata, 4,142,011, Cl. 427-431.000.
Bake, Earl A.; and Stephens, Leonard J., to Rockwell International Corporation. Seal assembly for valves. 4,141,538, Cl. 251-315.000.
Baker, David M., to Burroughs Corporation. Asynchronous storage loop type bubble chip architecture. 4,142,248, Cl. 365-15.000.
Balandin, Genrikh D.; and Rumyantsev, Nikolai G. Cathode-ray tube with variable energy of beam electrons. 4,142,133, Cl. 315-382.000.
Balazs, Endre A., to Biotrics, Inc. Ultrapure hyaluronic acid and the use thereof. 4,141,973, Cl. 424-180.000.
Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Stainless steel coated with aluminum. 4,141,760, Cl. 148-31.500.
Baldwin, William I.: *See—*
Buchele, Wesley F.; Baldwin, William I.; Eidet, James H.; and Marley, Steven J., 4,141,419, Cl. 172-1.000.
Ball, Herbert L.: *See—*
Campbell, John M.; Ball, Herbert L.; Bymoen, Darrell A.; Ewen, Douglas G.; Hise, Ronald D.; Stribley, Charles R.; and West, Gaylon L., 4,141,295, Cl. 102-10.000.
Balland, Jean, to Manufacture de Produits Chimiques Protex Societe Anonyme. Method of bleaching textile fibers and activated bath for the cold bleaching of such fibers. 4,141,685, Cl. 8-110.000.
Barbara, Louis J. Sound recording system. 4,141,344, Cl. 128-1.00C.
Barclay, Donald J.; and Morgan, William M., to International Business Machines Corporation. Method and composition for electroplating chromium and its alloys and the method of manufacture of the composition. 4,141,803, Cl. 204-51.000.
Bargenda, Siegfried, to Keiper Trainingsysteme GmbH & Co. Ergometers. 4,141,248, Cl. 73-379.000.
Barker, Peter J.; and Cheal, Gerald R., to Imperial Chemical Industries Limited. Method of thermoforming. 4,141,771, Cl. 156-222.000.
Barlow, Gordon A.; and Schoenfield, Palmer J., to Marvin Glass & Associates. Action toy. 4,141,175, Cl. 46-103.000.
Barmag Barmer Maschinenfabrik AG: *See—*
Berges, Dietrich; Saam, Ulrich; Fuhrer, Robert; and Damzog, Bodo, 4,141,205, Cl. 57-58.320.
Barnett, James V.; Duff, Donald R.; and Wickwar, Larry D., to Fairchild Camera and Instrument Corporation. Crystal controlled oscillator and method of tuning same. 4,141,209, Cl. 58-23.00A.
Baron, Martin: *See—*
Levinsohn, Ronald; and Baron, Martin, 4,141,097, Cl. 5-333.000.
Baron, Robert P., to Texas Instruments Incorporated. Multi-frequency digital wave synthesizer for providing analog output signals. 4,142,245, Cl. 364-900.000.
Barradas, George. Electrical appliance. 4,142,094, Cl. 219-524.000.
Bass, Malley R.: *See—*
Ewan, Thomas K.; Bass, Malley R.; Means, Jennings D.; Frier, James L.; and Holland, Orvis L., 4,141,701, Cl. 55-90.000.
Bauerle, Kurt: *See—*
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Baxter Travenol Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, 4,141,800, Cl. 204-1.00T.
Dieterich, Dieter; Markusch, Peter; and Reiff, Helmut, 4,142,030, Cl. 521-100.000.
Draber, Wilfried; Plempel, Manfred; Buchel, Karl H.; and Regel, Erik, 4,141,981, Cl. 424-263.000.
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,142,035, Cl. 528-177.000.
Immel, Otto; de Jager, Andre; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,141,896, Cl. 260-239.30A.
Kappler, Ulrich; and Sundermann, Rudolf, 4,142,048, Cl. 544-219.000.
Keggenhoff, Berthold; Rosenkranz, Hans J.; and Rudolph, Hans, 4,141,806, Cl. 204-159.220.
Kraft, Klaus; and Eimers, Erich, 4,142,038, Cl. 528-288.000.
Mues, Volker; and Niggemann, Johannes, 4,141,714, Cl. 71-27.000.
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.
Schulte, Klaus; and Ersfeld, Heinrich, 4,141,470, Cl. 222-137.000.
Thelen, Bernd; Brandt, Hans-Walter; Auge, Wolfgang; and Thiem, Karl-Werner, 4,141,799, Cl. 203-48.000.
Thiel, Reinhard; Dietz, Karl-Heinz; Kerres, Hans; Rosenbaum, Heinz J.; and Steiner, Siegfried, 4,141,829, Cl. 210-63.00R.
Wingler, Frank; Schmidt, Adolf; Liebig, Lothar; and Wassmuth, Gerd, 4,141,934, Cl. 260-881.000.
BBC Brown, Boveri & Company: *See—*
Sittig, Roland; and DeBruyne, Patrick, 4,142,201, Cl. 357-38.000.
BBC Brown, Boveri & Company, Limited: *See—*
Houska, Jaroslav, 4,141,943, Cl. 264-24.000.
Kmetz, Allan R., 4,142,182, Cl. 340-765.000.
Beal, Richard E., to BICC Limited. Optical guides with flexible central reinforcing members. 4,141,622, Cl. 350-96.230.
Bean, Bradford M.; Langston, Keith N.; Partridge, Richard L.; and Sy, Kian-Bon K., to International Business Machines Corporation. Bias filter memory for filtering out unnecessary interrogations of cache directories in a multiprocessor system. 4,142,234, Cl. 364-200.000.
Beck, Louis. Nozzle assembly with adjustable orifice. 4,141,503, Cl. 239-394.000.
Becker, Edmund H.; and Lindstrom, Robert O., to SCM Corporation. Apparatus for the production of reconstituted pimiento. 4,141,287, Cl. 99-450.100.
Becker, Frank C.; and Li, Jorge P., to Abbott Laboratories. N-(2-Methyl-1-naphthyl)-maleimide. 4,141,905, Cl. 260-326.5FM.
Becker, Otto A. Prestressed hollow chamber composite structural element capable of supporting heavy loads. 4,141,183, Cl. 52-127.000.
Becker, Wolf-Jurgen: *See—*
Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, 4,141,800, Cl. 204-1.00T.
Beckman Instruments, Inc.: *See—*
Wright, Herschel E., 4,141,489, Cl. 233-26.000.
Beckman, Paul. Method of forming a protective covering about a thermometer. 4,141,961, Cl. 264-230.000.
Beebe, J. Ted. Saddle clamp and method of manufacture. 4,141,577, Cl. 285-382.200.
Beech Aircraft Corporation: *See—*
Zaharia, Sidney D., 4,141,294, Cl. 102-6.000.
Begin, Louis E.: *See—*
Dunbar, Joseph E.; Begin, Louis E.; Broesma, Robert J.; and Dickerson, George D., 4,141,983, Cl. 424-267.000.
Beijer, Gene; Smith, James S.; and Sheffer, Ralph L., to Adams Rite Products, Inc. Fail-safe lock for an airplane rudder. 4,141,520, Cl. 244-83.00A.
Belisomi, Pietro, to Indesit Industria Elettrodomestici Italiana S.p.A. Frequency selection receiver with variable time constant control loop. 4,142,158, Cl. 325-464.000.
Bell Telephone Laboratories, Incorporated: *See—*
Ahamed, Syed V., 4,142,066, Cl. 179-1.00P.
Bobeck, Andrew H., 4,142,247, Cl. 365-8.000.
Bobeck, Andrew H., 4,142,249, Cl. 365-19.000.
Hauser, Victor E., Jr.; and Sinha, Ashok K., 4,142,004, Cl. 427-39.000.
Hill, David W.; Katz, Lewis E.; Lavigna, Robert J.; and Reusser, Raymond E., 4,141,779, Cl. 156-617.0SP.
Bellotti, Marc; and Schnell, William J., to Baxter Travenol Laboratories, Inc. Apparatus for measuring ultrafiltration during dialysis. 4,141,834, Cl. 210-241.000.
Beloit Corporation: *See—*
Justus, Edgar J., 4,141,788, Cl. 162-125.000.
Justus, Edgar J., 4,141,789, Cl. 162-272.000.
Bendix Corporation, The: *See—*
Blatter, Albert, 4,142,170, Cl. 338-28.000.
Presley, Rex W., 4,141,432, Cl. 180-148.000.
Roberts, James K., 4,141,437, Cl. 188-340.000.
Wolber, William G., 4,141,326, Cl. 123-119.0EC.
Benes, David M.; Gates, Allan L.; and Ryan, Richard, to Benes, David M.; and Gates, Allan L. Wheelchair supporting sled. 4,141,566, Cl. 280-16.000.
Bengt Petersson New Products Investment AB: *See—*
Petersson, Bengt O., 4,141,140, Cl. 29-787.000.
Bennett, R. Brian P.: *See—*
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Benseler, Hans; and Schaefer, Horst, to PUMA-Sportschuhfabriken Rudolf Dassler KG, Firma. Footwear outer sole. 4,141,158, Cl. 36-32.00R.
Beny, Janos; Moore, James D.; and Ryan, John W., to Ideal Toy Corporation. Toy vehicle game. 4,141,553, Cl. 273-86.00B.
Benzon, William. Method and apparatus for drying and cooling products of a granular nature. 4,141,155, Cl. 34-34.000.
Berg, Peter G.: *See—*
Marcoux, Leo; and Berg, Peter G., 4,141,327, Cl. 123-122.00F.
Bergen, Bernard J., to Addison Products Company. Solar window unit. 4,141,337, Cl. 126-270.000.
Berger, Joel G., to Endo Laboratories Inc. Tranquilizing trans-hexahydro-pyrido-indole-2-alkanols, -alkanones, -alkanonitriles, -alkanoic acids, esters and amides. 4,141,980, Cl. 424-256.000.
Bergeron, Charles R., to Ethyl Corporation. Solvent recovery process. 4,141,937, Cl. 260-927.00N.
Berges, David A., to SmithKline Corporation. Intermediates for the preparation of 7-acyl-3-(substituted triazolylthiomethyl)cephalosporins. 4,142,046, Cl. 544-26.000.

Berges, Dietrich; Saam, Ulrich; Fuhrer, Robert; and Damzog, Bodo, to Barmag Barmer Maschinenfabrik AG. Stranding process and apparatus. 4,141,205, Cl. 57-58.320.

Berglund, Svante O., to Aktiebolaget Svenska Flaktfabriken. Device for clamping a cassette filter in a filter housing. 4,141,704, Cl. 55-379.000.

Bergman, Imanuel, to National Research Development Corporation. Methods and devices for determining the concentration of a component of a fluid. 4,141,689, Cl. 23-232.00R.

Bergman, Lawrence A.: *See*—
Moran, Michael W.; and Bergman, Lawrence A., 4,141,664, Cl. 403-53.000.

Bergstrom, Arthur E. Blast joint. 4,141,386, Cl. 138-147.000.

Berland, Ole, to Oticon Electronics A/S. Directional/omnidirectional hearing aid microphone with support. 4,142,072, Cl. 179-107.0FD.

Bernardi, Luigi: *See*—
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, 4,141,899, Cl. 546-118.000.

Bernardo, Matthew: *See*—
Cretella, Salvatore J.; Bernardo, Matthew; and De Musis, Ralph T., 4,141,127, Cl. 29-156.80B.

Bertini, Millo. Apparatus for making saw blades. 4,141,260, Cl. 76-25.00R.

Best, Roland W., to General Mills Chemicals, Inc. Large granule starch protective material for pressure sensitive microencapsulated coatings. 4,141,747, Cl. 106-210.000.

Bethlehem Steel Corporation: *See*—
Clark, Howard E.; and Hodgson, Norman D., 4,141,796, Cl. 201-39.000.

Beun, Jacobus H.: *See*—
Augustijn, Govert J. P.; and Beun, Jacobus H., 4,141,467, Cl. 222-38.000.

Beyl, Jean J. A. Heel hold-down pivot plate for ski binding. 4,141,571, Cl. 280-620.000.

Bharteey, Brij M.: *See*—
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BICC Limited: *See*—
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Bielomatik Leuze & Company: *See*—
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Bienz, Earl F., to United States of America, Army. Thermal camouflage. 4,142,015, Cl. 428-159.000.

Biethan, John D., Sr. Portable electric welder. 4,142,091, Cl. 219-130.100.

Bigler, Kenneth L.: *See*—
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Bildinov, Konstantin N.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Bindra, Jasjit S., to Pfizer Inc. Tetrazolo[a]quinazol-5-ones antiallergy and antiulcer agents. 4,141,979, Cl. 424-251.000.

Biotrics, Inc.: *See*—
Balazs, Endre A., 4,141,973, Cl. 424-180.000.

Bird, Stephen J., to Lucas Industries Limited. Electrical switch. 4,142,076, Cl. 200-4.000.

Birkenmayer, Helmut, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Apparatus for longitudinal deformation, for example by creasing or perforation, of paper webs prior to folding. 4,141,544, Cl. 270-86.000.

Bishop, Richard L.; and Gibson, William A., to Amdahl Corporation. Data processing system and information scanout employing checksums for error detection. 4,142,243, Cl. 364-900.000.

Bitjutskaya, Nina A.: *See*—
Tsygankov, Mikhail S.; Kosholkin, Valery N.; Bitjutskaya, Nina A.; and Malandin, Oleg G., 4,142,027, Cl. 429-159.000.

Bitsch, Rainer; and Marin, Heiner, to Siemens Aktiengesellschaft. Contact system for high-voltage power circuit breakers. 4,142,081, Cl. 200-251.000.

Blackburn, William A.; and Goodwin, Roy D., to Monsanto Company. Flexible laminates and processes for producing same. 4,142,017, Cl. 428-284.000.

Blackman, Wynona. Folding cooling lounge chair. 4,141,585, Cl. 297-180.000.

Blagov, Evgeny E.; Panteleev, Anatoly I.; and Dmitriev, Nikolai S. Apparatus for forming round bundles of rod-shaped articles. 4,141,289, Cl. 100-212.000.

Blanding, Kenneth R., to Oliver Machinery Company. Seal wrapping machine. 4,141,196, Cl. 53-550.000.

Blatter, Albert, to Bendix Corporation, The. High response temperature sensor. 4,142,170, Cl. 338-28.000.

Blochl, Hanns: *See*—
Schnall, Gunther; Aldenhoven, Klaus; and Blochl, Hanns, 4,141,545, Cl. 271-118.000.
Schnall, Gunther; and Blochl, Hanns, 4,141,649, Cl. 355-51.000.

Blomgren, George E.: *See*—
Leger, Violeta Z.; and Blomgren, George E., 4,142,028, Cl. 429-194.000.

Bloom, Allen, to RCA Corporation. Electro-optic device. 4,141,627, Cl. 350-349.000.

Blum, Helmut: *See*—
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Blunier, Dennis L., to Caterpillar Tractor Co. Method of mounting track pin. 4,141,125, Cl. 29-148.300.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Conductor-driven magnetic bubble memory with an expander-detector arrangement. 4,142,247, Cl. 365-8.000.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Conductor-access, magnetic bubble memory. 4,142,249, Cl. 365-19.000.

Bochkarev, Mikhail N.: *See*—
Domrachev, Georgy A.; Khamylov, Vyacheslav K.; Bochkarev, Mikhail N.; Zhuk, Boris V.; Kaverin, Boris S.; Nesterov, Boris A.; and Kirillov, Alexandr I., 4,141,778, Cl. 156-613.000.

Boeing Commercial Airplane Company: *See*—
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Bogan, Gary W., to Dow Chemical Company, The. Catalysts for reaction of carboxylic acids with polyepoxides. 4,141,865, Cl. 260-18.0EP.

Bogdanova, Olga V.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Boggs, Roger L.; and Sogge, John W., to Caterpillar Tractor Co. Track-type vehicle wheel having controlled impact resistance. 4,141,602, Cl. 305-57.000.

Bohemia, Inc.: *See*—
Williams, Vernon L.; and Westfall, Glen A., 4,141,775, Cl. 156-358.000.

Boikova, Svetlana B.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Bommersheim, Hans; Hettich, Bernhard; Keller, Helmut; Moser, Werner; and Tauchert, Klaus, to Kienzle Apparate GmbH. Printer for data-processing machine having single operator station. 4,141,660, Cl. 400-124.000.

Boniort, Jean-Yves; Brehm, Claude; and Floury, Yves, to Compagnie Generale d'Electricite. High-frequency electric furnace. 4,142,063, Cl. 13-27.000.

Borg-Warner Corporation: *See*—
Butler, James M., 4,141,932, Cl. 260-880.00R.

Borjeson, Jan T. Method of and means for sealing expansion and contraction joints of buildings and pavements. 4,141,189, Cl. 52-396.000.

Bornor, June R., to Alco Standard Corporation. Heat treating furnace with load control for fan motor. 4,141,539, Cl. 266-78.000.

Bornstein, Norman S.; and DeCrescente, Michael A., to United Technologies Corporation. Method for forming a single-phase nickel aluminide coating on a nickel-base superalloy substrate. 4,142,023, Cl. 428-680.000.

Borom, Marcus P.: *See*—
Greskovich, Charles D.; and Borom, Marcus P., 4,141,781, Cl. 156-637.000.

Bosso, Joseph F.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,141,810, Cl. 204-181.00C.

Bouillon, Jean, to Creusot-Loire. Installation for launching missiles. 4,141,277, Cl. 89-38.000.

Boulton, Thomas W., to Imperial Chemical Industries Limited. Diaphragm cell. 4,141,814, Cl. 204-252.000.

Bourns, Inc.: *See*—
Johansson, Fritz A., 4,142,148, Cl. 324-140.00R.
Smargiassi, Paul R., 4,141,356, Cl. 128-145.800.

Bouvet, Jean-Victor: *See*—
Henry, Raymond; and Bouvet, Jean-Victor, 4,141,135, Cl. 29-580.000.

Bracke, William J. I., to Laborfina S.A. Process for producing ABS resins. 4,141,933, Cl. 260-880.00R.

Brackney, Maurice R.: *See*—
Umpleby, Kenneth F.; and Brackney, Maurice R., 4,142,137, Cl. 318-283.000.

Braid, Milton, to Mobil Oil Corporation. Organic compositions containing esters of aryl aminoaryloxyalkanols. 4,141,848, Cl. 252-51.50A.

Brammall, Inc.: *See*—
Van Gompel, James J., 4,141,117, Cl. 24-136.00R.

Brandstetter, Heinz P. Device for the measurement of mechanical work and power. 4,141,245, Cl. 73-144.000.

Brandt, Hans-Walter: *See*—
Thelen, Bernd; Brandt, Hans-Walter; Auge, Wolfgang; and Thiem, Karl-Werner, 4,141,799, Cl. 203-48.000.

Brandt, Robert W.; Fisher, Robert D.; and Hill, James E., to Brandt, Robert W. Monitoring system. 4,142,238, Cl. 364-552.000.

Braun, Dieter, to Felten & Guilleaume Carlswerk AG. Method of molding insulating disks on coaxial-cable wire. 4,141,952, Cl. 264-251.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Coal plane with chain operated turning head. 4,141,593, Cl. 299-34.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,141,593, Cl. 299-34.000.

Bray, Wade R.: *See—*
Slaats, Mathew A.; Welsh, Alan B.; and Bray, Wade R., 4,142,139, Cl. 318-603.000.

Brehm, Claude: *See—*
Boniort, Jean-Yves; Brehm, Claude; and Floury, Yves, 4,142,063, Cl. 13-27.000.

Breining, Franklin E.; and Edelstein, Franklin H., to L & R Manufacturing Company. Circuitry for driving a non-linear transducer for ultrasonic cleaning. 4,141,608, Cl. 310-316.000.

Brendgens, Lothar, to Rollei-Werke Franke & Heidecke. Projector having an adjustable height. 4,141,523, Cl. 248-653.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Carbamoylalkylureido cephalosporins. 4,142,045, Cl. 544-21.000.

Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, to Bayer Aktiengesellschaft. Electrochemical gas detector and method of using same. 4,141,800, Cl. 204-1.00T.

Brickner, Kenneth G.; and Giove, John L., to United States Steel Corporation. Low-cost, high temperature oxidation-resistant steel. 4,141,724, Cl. 75-126.00D.

Bricot, Claude: *See—*
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.

Bridge, John F.: *See—*
Hart, Milburn L.; and Bridge, John F., 4,141,130, Cl. 29-407.000.

Bridger, Grover L., to Georgia Tech Research Institute. Process for producing phosphoric acid and dicalcium phosphate. 4,141,958, Cl. 43-167.000.

Briscoe, Harry H.; and Pillsbury, John L. Power demand limiting circuit. 4,141,407, Cl. 165-12.000.

British Oxygen Company Limited, The: *See—*
Smith, Kenneth C.; and Garrett, Michael E., 4,141,823, Cl. 210-17.000.

Brizzolara, Donald F.; and Honsberg, Wolfgang, to Du Pont de Nemours, E. I., and Company. Polychloroprene-polyvinyl alcohol latex. 4,141,875, Cl. 260-29.70E.

Brock, Gregory K.: *See—*
Arnold, Eugene W.; Brock, Gregory K.; and Halley, David G., 4,141,390, Cl. 141-9.000.

Broesma, Robert J.: *See—*
Dunbar, Joseph E.; Begin, Louis E.; Broesma, Robert J.; and Dickerson, George D., 4,141,983, Cl. 424-267.000.

Brooks, Norman B.; and Olmstead, Michael M., to Pass-Port Systems Corporation. Wafer transport system. 4,141,458, Cl. 214-301.000.

Broom, D. Dwayne. Garden row locator and marker. 4,141,146, Cl. 33-86.000.

Brown, Alfred: *See—*
Wu, Ching H.; Brown, Alfred; Konopnicki, Daniel T.; and Allen, Joseph C., 4,141,415, Cl. 166-252.000.

Brown, Robert J., to R. J. Brown and Associates AG. Underwater pipeline laying method and apparatus. 4,141,667, Cl. 405-161.000.

Brown & Root, Inc.: *See—*
Fernandez, Ramon J.; and Kahl, John S., 4,141,377, Cl. 137-236.000.

Browning Arms Company: *See—*
Hillberg, Robert L., 4,141,164, Cl. 42-17.000.

Brummund, Walter, Jr.: *See—*
Dorwart, William V., Jr.; and Brummund, Walter, Jr., 4,141,856, Cl. 252-408.000.

Brunet, Maurice: *See—*
Habermann, Helmut; and Brunet, Maurice, 4,141,604, Cl. 308-10.000.

Brunetti, Heimo: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,141,883, Cl. 260-45.80N.

Brunswick Corporation: *See—*
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., 4,142,022, Cl. 428-432.000.
Van Petten, Louis B., 4,141,481, Cl. 228-145.000.

Bryant, Steven D.: *See—*
Tipton, Larry J.; and Bryant, Steven D., 4,141,328, Cl. 123-138.000.

Buchel, Karl H.: *See—*
Draber, Wilfried; Plempel, Manfred; Buchel, Karl H.; and Regel, Erik, 4,141,981, Cl. 424-263.000.

Buchele, Wesley F.; Baldwin, William I.; Eidet, James H.; and Marley, Steven J., to Iowa State Univ. Research Foundation, Inc. Method and apparatus for controlling the approach angle of a plow unit in response to speed variations. 4,141,419, Cl. 172-1.000.

Buchner, Heinrich, to Klockner-Humboldt-Deutz. Method for the cooling of a shaft furnace for the calcining of lime, dolomite or magnesite. 4,141,154, Cl. 34-20.000.

Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., to PPG Industries, Inc. Cationic electrodeposition using aqueous dispersions of quaternary ammonium carbonate-containing polymers. 4,141,810, Cl. 204-181.00C.

Buck, Hermann: *See—*
Negro, Guido; Mann, Frider; and Buck, Hermann, 4,141,099, Cl. 11-1.00A.

Buell, Kenneth B., to Procter & Gamble Company, The. Method and apparatus for forming a continuous reinforced fibrous web. 4,141,772, Cl. 156-227.000.

Bullard Company, The: *See—*
Grinage, Claude M., 4,141,133, Cl. 29-568.000.

Bultemeier, Keith D.: *See—*
Sollner, George H.; Bultemeier, Keith D.; and Remaks, Richard D., 4,141,886, Cl. 528-273.000.

Bulten-Kanthal AB: *See—*
Svensson, Stig; Camitz, Carl-Henning; and Lindgren, Stig, 4,141,211, Cl. 59-16.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-3,7-inter-m-phenylene-3-oxa-4,5,6-trinor-11-deoxy-PGE$_1$compounds. 4,141,918, Cl. 260-590.00C.

Bunkowski, Kenneth D., to Formica Corporation. Rapid curing melamine-formaldehyde resin composition. 4,141,872, Cl. 260-29.40R.

Bureau de Recherches Geologiques et Minieres: *See—*
Clin, Francois H.; Gony, Jean-Noel M.; and Proust, Francois O., 4,141,450, Cl. 209-3.100.

Burk, George A.: *See—*
Goralski, Christian T.; and Burk, George A., 4,141,916, Cl. 260-556.0AR.

Burk, Michael T.: *See—*
Sweany, Louis P.; and Burk, Michael T., 4,142,186, Cl. 340-388.000.

Burleigh, Peter H.: *See—*
Nametz, Richard C.; and Burleigh, Peter H., 4,141,880, Cl. 260-37.00N.

Burnett, James D.: *See—*
Evans, Mack N.; and Burnett, James D., 4,141,322, Cl. 119-106.000.

Burns, Richard J., to Union Carbide Corporation. Stable, water-borne vinyl chloride resin emulsion compositions. 4,141,870, Cl. 260-29.4UA.

Burr-Brown Research Corporation: *See—*
Olschewski, Wilfred W., 4,142,075, Cl. 179-170.0NC.

Burroughs Corporation: *See—*
Baker, David M., 4,142,248, Cl. 365-15.000.

Burruss, Robert P. Noncombustion system for the utilization of tobacco and other smoking materials. 4,141,369, Cl. 131-171.00A.

Burson, David C., to Texas Instruments Incorporated. Digital joystick control interface system for video games and the like. 4,142,180, Cl. 340-709.000.

Bushin, Alexandr N.: *See—*
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Busse, Peter, to Richard Heinze, Firma. Cabinet fitting. 4,141,108, Cl. 16-129.000.

Butler, James M., to Borg-Warner Corporation. Combined emulsion and suspension process for producing graft ABS bead-like particles. 4,141,932, Cl. 260-880.00R.

Bye, Carolyn N., to National Casein of New Jersey. Proteinaceous adhesive composition with tetrahydrofurfuryl alcohol. 4,141,745, Cl. 106-146.000.

Byers, Thomas L. Color separated font. 4,141,732, Cl. 96-41.000.

Bymoen, Darrell A.: *See—*
Campbell, John M.; Ball, Herbert L.; Bymoen, Darrell A.; Ewen, Douglas G.; Hise, Ronald D.; Stribley, Charles R.; and West, Gaylon L., 4,141,295, Cl. 102-10.000.

C M Industries: *See—*
Krausz, Francois; and Calvet, Alain, 4,141,971, Cl. 424-180.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary, 4,141,508, Cl. 239-664.000.

Cabut, Louis A.; Hardouin, Jean-Claude H. R.; Huille, Michel E. A.; and Pigasse, Daniel, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of phthalocyanine pigments. 4,141,904, Cl. 260-314.500.

Cadalzo, Concepcion. Windmill mechanism. 4,141,215, Cl. 60-398.000.

Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., to Austin Powder Company. Carrier for explosive primer and method of using same. 4,141,296, Cl. 102-24.00R.

Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., to Dow Chemical Company, The. Process for preparing an electrode for electrolytic cell having a coating of a single metal spinel, Co_3O_4. 4,142,005, Cl. 427-126.000.

Calgon Corporation: *See—*
Antonetti, Joseph M.; and Snow, Glen F., 4,141,691, Cl. 44-1.00R.

Calvet, Alain: *See—*
Krausz, Francois; and Calvet, Alain, 4,141,971, Cl. 424-180.000.

Calzini, Mario, to O.M.A.C. Caprara S.a.s. Friction film driving device for developing machine. 4,141,480, Cl. 226-25.000.

Camacho, Salvador L., to Technology Application Services Corporation. Apparatus for the gasification of carbonaceous matter by plasma arc pyrolysis. 4,141,694, Cl. 48-61.00.

Camco, Incorporated: *See—*
Morris, Arthur J.; and Garner, James K., Jr., 4,141,413, Cl. 166-120.000.

Cameron, Ian R.; and Cooper, John, to Imperial Chemical Industries Limited. Slurry explosive composition. 4,141,766, Cl. 149-2.000.

Camitz, Carl-Henning: *See—*
Svensson, Stig; Camitz, Carl-Henning; and Lindgren, Stig, 4,141,211, Cl. 59-16.000.

Campbell, George E., Jr.; Nelson, Joseph W.; and Russell, Gordon A., to Suntech, Inc. Universal steam trap insulator. 4,141,387, Cl. 138-158.000.

Campbell, John M.; Ball, Herbert L.; Bymoen, Darrell A.; Ewen,

Douglas G.; Hise, Ronald D.; Stribley, Charles R.; and West, Gaylon L., to United States of America, Navy. Actuation mine simulator. 4,141,295, Cl. 102-10.000.

Campolong, Joseph, to Pall Corporation. Vortex separator. 4,141,705, Cl. 55-394.000.

Canadian Patents and Development Limited: *See*—
Lau, John H. W.; and Margerum, C. James, 4,142,089, Cl. 219-121.00P.

Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; and Ohta, Shoji, 4,141,620, Cl. 350-6.800.
Hasegawa, Tetsuo; Touma, Hitoshi; Satomi, Kunio; and Miyamae, Tatsuo, 4,141,849, Cl. 252-62.10P.
Sato, Tadashi; Torigai, Akiyoshi; Kasamura, Toshirou; and Tanaka, Hidetoshi, 4,141,644, Cl. 355-3.0CH.
Soma, Ikuo; Magome, Tamotu; and Komiya, Yutaka, 4,141,646, Cl. 355-10.000.

Canty, George, to Minnesota Mining and Manufacturing Company. Photosensitive composite sheet material containing poly-2,5-oxolane. 4,141,736, Cl. 96-87.00R.

Carlson, David E.; Wronski, Christopher R.; and Triano, Alfred R., Jr., to RCA Corporation. Schottky barrier semiconductor device and method of making same. 4,142,195, Cl. 357-15.000.

Carlson, David H. J., to UOP Inc. Process for treating a sour petroleum distillate. 4,141,819, Cl. 208-206.000.

Carlson, Edwin S.: *See*—
Reedy, Charles E.; and Carlson, Edwin S., 4,141,535, Cl. 251-144.000.

Carlson, Harold C. Mollusk shucker. 4,141,114, Cl. 17-74.000.

Carnmalm, Bernt S. E.; Lindberg, Ulf H. A.; De Paulis, Tomas; Ross, Svante B.; Stjernstrom, Nils-Erik; Ulfi, Carl B. J.; and Ogren, Sven-Ove, to Astra Lakemedel Aktiebolaget. Compounds of diphenylcyclopentylamine type and methods for their preparation. 4,141,993, Cl. 424-330.000.

Carpenter, Frederick C., to Smiths Industries Limited. Electrical igniters. 4,142,121, Cl. 313-131.00A.

Carrier Corporation: *See*—
Lavigne, William J., Jr.; and Leonard, Louis H., 4,141,708, Cl. 62-117.000.

Carroll, John F., Jr.: *See*—
Schrader, Robert W.; and Carroll, John F., Jr., 4,141,735, Cl. 96-75.000.

Cartner, Donald W.: *See*—
Hopkins, Evan L.; and Cartner, Donald W., 4,141,111, Cl. 15-236.00R.

Caruso, Fred A.: *See*—
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,141,960, Cl. 423-417.000.

Cason, Charles M., Sr.; and Cason, Charles M., III. Voting system. 4,142,095, Cl. 235-54.00F.

Cason, Charles M., III: *See*—
Cason, Charles M., Sr.; and Cason, Charles M., III, 4,142,095, Cl. 235-54.00F.

Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, to Merck & Co., Inc. Antibiotics 890A_2 and 890A_5. 4,141,986, Cl. 424-274.000.

Castleberry, Clarence F.; and Castleberry, Michael F. Draw/display means. 4,142,183, Cl. 340-706.000.

Castleberry, Michael F.: *See*—
Castleberry, Clarence F.; and Castleberry, Michael F., 4,142,183, Cl. 340-706.000.

Castrol Limited: *See*—
Askew, Herbert F.; Harrington, Colin J.; and Jayne, Gerald J. J., 4,141,851, Cl. 252-78.300.

Casutt, Toni. Banana holder. 4,141,529, Cl. 248-359.000.

Caterpillar Tractor Co.: *See*—
Blunier, Dennis L., 4,141,125, Cl. 29-148.300.
Boggs, Roger L.; and Sogge, John W., 4,141,602, Cl. 305-57.000.
Cline, Lawrence R., 4,141,598, Cl. 305-28.000.
Cline, Michael I.; and Olt, Arthur E., Jr., 4,141,423, Cl. 180-9.600.
Engel, William K., 4,141,216, Cl. 60-454.000.
Feucht, Dennis D., 4,141,220, Cl. 60-698.000.
Lawrence, Dean M., 4,141,102, Cl. 15-250.160.
Lorimor, Larry W., 4,141,280, Cl. 91-29.000.
Olson, Harris S., 4,141,160, Cl. 37-141.00R.
Scott, Ronald K., 4,141,242, Cl. 73-117.300.
Stedman, Robert N., 4,141,601, Cl. 305-54.000.
Walzer, James L., 4,141,258, Cl. 74-540.000.

Celanese Polymer Specialties Company: *See*—
Shimp, David A.; and Mitzel, Robert B., 4,141,871, Cl. 260-29.40R.

Central Research Laboratories, Inc.: *See*—
Eisert, Gerald A., 4,141,609, Cl. 312-1.000.

Cerberus AG: *See*—
Zetting, Alois; and Kopfli, Markus, 4,142,188, Cl. 340-558.000.

Champion International Corporation: *See*—
Lambert, Herbert L., 4,141,485, Cl. 229-17.0SC.

Chan, David C. K., to Chevron Research Company. Fungicidal 3-(N-chloroacetyl-N-arylamino)-gamma-butyrolactone compositions. 4,141,989, Cl. 424-279.000.

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for producing liquid modified protein. 4,141,996, Cl. 426-44.000.

Chang, James J. S., to Precision Monolithics, Inc. Voltage sensitive supercharger for a sample and hold integrated circuit. 4,142,117, Cl. 307-353.000.

Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to Thomson-CSF. Time-division and spatial connection network. 4,142,068, Cl. 179-15.0AT.

Charters, Alexander C.: *See*—
Hollingsworth, Guilford L.; and Charters, Alexander C., 4,141,275, Cl. 89-1.703.

Cheal, Gerald R.: *See*—
Barker, Peter J.; and Cheal, Gerald R., 4,141,771, Cl. 156-222.000.

Chemie Linz Aktiengesellschaft: *See*—
Franzmair, Rudolf, 4,142,051, Cl. 548-315.000.

Chen, Chin L.; and Hsiao, Mu Y., to International Business Machines Corporation. High speed decoding of Reed-Solomon codes. 4,142,174, Cl. 340-146.1AL.

Cherednichenko, Vladimir S.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Chevron Research Company: *See*—
Chan, David C. K., 4,141,989, Cl. 424-279.000.
Offermann, Paul F., 4,142,093, Cl. 219-301.000.
Sullivan, Richard F., 4,141,82[illegible], Cl. 208-251.00H.
Suzuki, Shigeto, 4,142,057, Cl. 562-525.000.
Wilkes, John B., 4,142,061, Cl. 568-909.000.

Chiang, Alice M.; Denley, Brian W.; and Gelpey, Jeffrey C., to Honeywell Inc. Method of making a gap UV photodiode by multiple ion-implantations. 4,141,756, Cl. 148-1.500.

Chichkov, Jury V.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.

Chidlow, John W.; and Porter, Philip, to Internationale Octrooimaatschappij "Octropa" B.V. Method for enhancing the resistance of new born mammalian young to gastro-intestinal infections. 4,141,970, Cl. 424-92.000.

Childs, David L.: *See*—
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,141,296, Cl. 102-24.00R.

Chinone, Naoki: *See*—
Tsukada, Toshihisa; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,142,160, Cl. 331-94.50H.

Chisholm-Ryder Company, Inc.: *See*—
Keillor, Benjamin O., 4,141,203, Cl. 56-328.0[illegible].

Chlorine Engineers Corp., Ltd.: *See*—
Ichisaka, Teruo; and Ikegami, Tadao, 4,141,815, Cl. 204-290.00F.

Choi, Charles K., to Occidental Petroleum Corporation. Grid-wall pyrolysis reactor. 4,141,794, Cl. 201-12.000.

Chong, Ian M.: *See*—
Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton, 4,141,956, Cl. 422-116.000.

Choyke, Wolfgang J.; and Hoffman, Richard A., to Westinghouse Electric Corp. Method of making a high power laser mirror. 4,142,006, Cl. 427-162.000.

Christensen, Steven H. Apparatus for cutting tops from plants. 4,141,201, Cl. 56-121.420.

Christenson, Roger M.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,141,810, Cl. 204-181.00C.

Church, Rocco L. Garage-patio door. 4,141,403, Cl. 160-201.000.

Chyung, Kenneth; and Wusirika, Raja R., to Corning Glass Works. Oxynitride glass-ceramics. 4,141,739, Cl. 106-39.600.

Ciba-Geiby AG: *See*—
Lenoir, John; and Marthaler, Max, 4,141,734, Cl. 96-53.000.

Ciba-Geigy Corporation: *See*—
Adler, Arnold S., 4,141,903, Cl. 260-308.00B.
Babler, Fridolin, 4,141,881, Cl. 260-40.00P.
Gremmelmaier, Claude, 4,141,919, Cl. 260-594.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,141,982, Cl. 424-267.000.
Hegar, Gert; and Back, Gerhard, 4,141,890, Cl. 260-153.000.
Illy, Hugo, 4,142,029, Cl. 521-95.000.
Karrer, Friedrich, 4,141,921, Cl. 568-636.000.
Martin, Henry, 4,141,718, Cl. 71-95.000.
Miller, Ralph, 4,141,963, Cl. 423-592.000.
Mory, Rudolf; and Muller, Rolf, 4,141,891, Cl. 260-155.000.
Schlapfer, Hans, deceased; and Schlapfer, Alex R., heir, 4,141,900, Cl. 260-308.00A.
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,141,883, Cl. 260-45.80N.

Cincinnati Milacron: *See*—
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,141,966, Cl. 424-45.000.

Cincinnati Milacron Inc.: *See*—
Schroll, Gene E., 4,142,034, Cl. 528-120.000.

Citizens Bank and Trust Company, legal representative: *See*—
Levin, Gilbert V.; Tarnay, Alexandra G.; Topol, George J., deceased; and Citizens Bank and Trust Company, legal representative, 4,141,822, Cl. 210-6.000.

Clamage, Herbert M. Tree simulative display. 4,142,012, Cl. 428-8.000.

Clardy, Edwin K.: *See*—
DeFord, Donald D.; and Clardy, Edwin K., 4,141,237, Cl. 73-23.100.

Clark, Howard E.; and Hodgson, Norman D., to Bethlehem Steel

Corporation. Coke oven emission control method and apparatus. 4,141,796, Cl. 201-39.000.

Clements, John A.: *See—*
Forrest, Gordon C.; Jay, Ronald F.; and Clements, John A., 4,141,687, Cl. 23-230.00R.

Cliffe, Ian, to Garrod and Lofthouse Limited. Tape cassettes storage and display. 4,141,446, Cl. 206-387.000.

Clin, Francois H.; Gony, Jean-Noel M.; and Proust, Francois O., to Bureau de Recherches Geologiques et Minieres. Method and apparatus for sorting mixtures of materials by ballistic effect and differential adherence. 4,141,450, Cl. 209-3.100.

Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Uniform thermomigration utilizing sample movement. 4,141,757, Cl. 148-1.500.

Cline, Lawrence R., to Caterpillar Tractor Co. Track roller assembly. 4,141,598, Cl. 305-28.000.

Cline, Michael I.; and Olt, Arthur E., Jr., to Caterpillar Tractor Co. Vehicle suspension apparatus. 4,141,423, Cl. 180-9.600.

Cloessner, Jacob E., Jr. Eyeglasses temple construction. 4,141,628, Cl. 351-111.000.

Coester, Erwin: *See—*
Pfistermeister, Martin; Krapf, Heinz; and Coester, Erwin, 4,141,759, Cl. 148-6.350.

Coldren, Kenneth M., to M & W Gear Company. Cultivator and liquid fertilizer blade. 4,141,301, Cl. 111-7.000.

Cole, Albert V.; and Morton, Arthur F., to Nabisco, Inc. Apparatus for separating articles into groups by weight. 4,141,442, Cl. 198-429.000.

Colgate-Palmolive Company: *See—*
Fischer, Charles F.; and Joshi, David P., 4,141,947, Cl. 264-75.000.
Mitchell, Robert L., 4,141,969, Cl. 424-52.000.

Collin Consult AB: *See—*
Collin, Lars T., 4,141,241, Cl. 73-117.300.

Collin, Lars T., to Collin Consult AB. Analyzing exhaust gases from an internal combustion engine. 4,141,241, Cl. 73-117.300.

Colt Industries Operating Corp.: *See—*
Dichter, Wilhelm; Tatro, Henry J.; and Warner, C. Edward, 4,141,165, Cl. 42-65.000.

Comdial Corporation: *See—*
Lake, Don W., 4,142,184, Cl. 340-347.0DA.

Compagnie Generale d'Electricite: *See—*
Boniort, Jean-Yves; Brehm, Claude; and Floury, Yves, 4,142,063, Cl. 13-27.000.

Conger, Franklin E., to Stone & Webster Engineering Corporation. Desalination process system and by-product recovery. 4,141,825, Cl. 210-23.00H.

Continental Group, Inc., The: *See—*
Mascia, Carmen T.; and Jordan, Thomas F., 4,141,448, Cl. 206-485.000.

Continental Oil Company: *See—*
Convers, Ronald J., 4,141,922, Cl. 260-652.00P.

Control Data Corporation: *See—*
Harte, Kenneth J., 4,142,132, Cl. 315-370.000.

Convers, Ronald J., to Continental Oil Company. Process for purification of 1,2-dichloroethane. 4,141,922, Cl. 260-652.00P.

Cook, Victor J., Jr. Supportive furniture system, such as a chair system, and method of manufacture. 4,141,584, Cl. 297-41.000.

Cooper, John: *See—*
Cameron, Ian R.; and Cooper, John, 4,141,766, Cl. 149-2.000.

Cooper, Keith A.: *See—*
Gordon, Robert L.; Naugle, George H.; and Cooper, Keith A., 4,141,466, Cl. 220-462.000.

Cooper, Ronald H.: *See—*
Moon, Tag Y.; and Cooper, Ronald H., 4,141,737, Cl. 106-12.000.

Copal Company Limited: *See—*
Hata, Yoshio; and Harada, Hiroyuki, 4,141,291, Cl. 101-99.000.
Inoue, Nobuyoshi, 4,141,634, Cl. 354-154.000.
Ooba, Osamu, 4,141,638, Cl. 354-246.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of rubber and polyester. 4,141,863, Cl. 260-3.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of CSM rubber and polyolefin resin. 4,141,878, Cl. 260-33.6AQ.

Coratomic, Inc.: *See—*
Shipko, Frederick J., 4,141,752, Cl. 128-419.00P.

Corbett, Charles K., to United States of America, United States. Microphone. 4,142,074, Cl. 179-124.000.

Corning Glass Works: *See—*
Chyung, Kenneth; and Wusirika, Raja R., 4,141,739, Cl. 106-39.600.
Lock, William E.; and Thrower, Jesse C., 4,141,515, Cl. 242-54.00R.
Luttinger, Manfred; Olszewski, Anthony R.; and Parnell, Donald R., 4,141,877, Cl. 260-37.0EP.

Corse, Louis G., to Machines Chambon. Rotary multi-color printing machine. 4,141,293, Cl. 101-181.000.

Corvese, Louis, Jr. Tube holder for immobile patients. 4,141,524, Cl. 248-70.000.

Coscia, Anthony T.; and O'Connor, Michael N. D., to American Cyanamid Company. Process for clarifying coal wash waters. 4,141,827, Cl. 210-54.000.

Couchman, James C., to General Dynamics Corporation. Hole tester using a permeable protective sleeve insertible in said hole and adapted to receive a relatively movable eddy current probe. 4,142,154, Cl. 324-219.000.

Coulon, Jean-Claude: *See—*
Ammannati, Piero; and Coulon, Jean-Claude, 4,141,713, Cl. 65-182.00R.

Courty, Philippe; Ajot, Hubert; and Delmon, Bernard, to Institut Francais du Petrole. Gels containing iron and molybdenum. 4,141,861, Cl. 252-462.000.

Creed, Bruce W. Method and apparatus for cleaning suction ducts. 4,141,753, Cl. 134-8.000.

Crest Lock Company: *See—*
Sheiman, Samuel R.; and Sheiman, Julius, 4,141,107, Cl. 16-128.00R.

Cretella, Salvatore J.; Bernardo, Matthew; and De Musis, Ralph T. Method of refurbishing turbine vane or blade components. 4,141,127, Cl. 29-156.80B.

Creusot-Loire: *See—*
Bouillon, Jean, 4,141,277, Cl. 89-38.000.

Crise, W. Paul. Cleaner using high velocity air jets having a double valve. 4,141,103, Cl. 15-346.000.

Croisier, Alain; Esteban, Daniel; and Galand, Claude, to International Business Machines Corporation. Quantizing process with dynamic allocation of the available bit resources and device for implementing said process. 4,142,071, Cl. 179-15.55R.

Cronin, Christopher H., to Fisons Limited. Method for increasing yield of soy beans. 4,141,716, Cl. 71-90.000.

Crooks, Basil D.; and Bennett, R. Brian P., to Northern Telecom Limited. Welding gun adapted to weld fixed contacts on wire spring relays. 4,142,087, Cl. 219-90.000.

Cross, Thomas E., Jr.; and Gray, Douglas R., to Medtronic, Inc. Lead connector for tape electrode. 4,141,366, Cl. 128-418.000.

Crowley, Ralph P.; and Staples, Max G., to Phillips Petroleum Company. Preventing ammonium chloride deposition in hydrogen recycle stream. 4,141,816, Cl. 208-107.000.

Csillag, Andreas; Locher, Dieter; and Wedermann, Klaus, to Licentia-Patent-Verwaltungs-G.m.b.H. Multi-layer metal connecting contact and method for making it. 4,142,202, Cl. 357-71.000.

Culbertson, Donald L. Air-to-air heat recuperating unit. 4,141,412, Cl. 165-166.000.

Culhane, Danny F.: *See—*
Culhane, Vernon C.; and Culhane, Danny F., 4,141,098, Cl. 6-2.00R.

Culhane, Vernon C.; and Culhane, Danny F., to Culhane, Vernon C.; and Culhane, Danny F. Honey super. 4,141,098, Cl. 6-2.00R.

Cummins, Judith G., to Analytical Instrument Specialties, Inc. Anchoring means for TLC syringe and apparatus. 4,141,833, Cl. 210-198.00C.

Cuomo, Carlo E.: *See—*
Louder, Nevitt M.; and Cuomo, Carlo E., 4,141,312, Cl. 118-7.000.

Curt G. Joa, Inc.: *See—*
Radzins, Edmund A., 4,141,509, Cl. 241-30.000.

Cuthbert, Jerry W.; and Davis, Sydney, to United States of America, Navy. Combined radial diffuser and control valve for high-pressure fans. 4,141,506, Cl. 239-456.000.

Cutler, Ivan B.; and Miller, Patrick D., to University of Utah. Solid solution and process for producing a solid solution. 4,141,740, Cl. 106-44.000.

Cutter Laboratories, Inc.: *See—*
Gay, John C.; and Marsland, William P., 4,141,975, Cl. 424-217.000.
Manske, Reinhold R., 4,141,379, Cl. 137-496.000.

Daghe, Joseph L., to Mueller Co. Valve seat construction for butterfly valves. 4,141,537, Cl. 251-306.000.

Dahlback, Gunnar; and Hellquist, Ivan A., to AGA Aktiebolag. Warning arrangement for breathing apparatus for divers. 4,141,353, Cl. 128-142.00R.

Daicel Ltd.: *See—*
Ando, Ken; Kamosaki, Minoru; Ohya, Yoshinobu; and Asai, Sigeru, 4,141,774, Cl. 156-309.000.

Daikin Kogyo Co., Ltd.: *See—*
Oka, Masahiko; Tanigawa, Singo; Suzuki, Takesi; Tomoda, Masayasu; and Ueta, Yutaka, 4,141,874, Cl. 260-29.60F.

Dakota Cat Eye Inc.: *See—*
Muehl, Lawrence L., 4,141,167, Cl. 43-2.000.

Dalgoutte, David G.: *See—*
Ellwood, George; and Dalgoutte, David G., 4,141,776, Cl. 156-502.000.

Damzog, Bodo: *See—*
Berges, Dietrich; Saam, Ulrich; Fuhrer, Robert; and Damzog, Bodo, 4,141,205, Cl. 57-58.320.

Danfoss A/S: *See—*
Dyhr, Jan; and Nissen, Ole J., 4,141,223, Cl. 62-469.000.
Valbjorn, Knud V.; and Graversen, Niels P. G., 4,141,497, Cl. 236-51.000.

D'Angelo, Paul F., to Union Carbide Corporation. Process for improving barrier properties of polymers. 4,142,032, Cl. 526-43.000.

Daniel, Richard A., to United States of America, Navy. Lightning ground system attachable admittance testing instrument. 4,142,143, Cl. 324-51.000.

Darby, William L.; Monz, Robert H.; and Molis, Stephen J., to General Electric Company. Cooling arrangement for rotor end turns of reverse flow cooled dynamoelectric machines. 4,141,669, Cl. 408-1.00R.

Dart Industries Inc.: *See—*
Readio, Philip D.; and Allan, John L. H., 4,141,850, Cl. 252-79.400.

Daumas, Jean-Claude: *See—*
Dupuy, Georges; Daumas, Jean-Claude; and Michel, Max, 4,141,962, Cl. 423-571.000.

D'Autry, Eric M. Plural piston, adjustable diluting device having a volume indicator assembly. 4,141,250, Cl. 73-425.600.

David, Samuel: *See—*
Thies, Peter W.; David, Samuel; Hauth, Hartmut; and Roemer, Dietmar, 4,141,988, Cl. 424-278.000.

Davies, Alan P.: *See—*
Aneja, Rajindra; Davies, Alan P.; and Keith, Maxwell C., 4,141,994, Cl. 424-331.000.

Davies, David H.; Ernill, Richard J.; and Norris, Geoffrey L. F., to Imperial Chemical Industries Limited. Veterinary method employing certain aureolic acid compounds. 4,141,974, Cl. 424-181.000.

Davis, Sydney: *See—*
Cuthbert, Jerry W.; and Davis, Sydney, 4,141,506, Cl. 259-456.000.

Davis, Walter L., to Motorola, Inc. Digital tone decoder system. 4,142,177, Cl. 340-171.00R.

Dean, Ivan E. Game with miniature oil well rig in a transparent dome. 4,141,555, Cl. 273-139.000.

Dean, Robert C., Jr.; Hoisington, Paul A.; Walsh, Brian F.; and Mastro, Frank E., to Life Sciences, Inc. Ocular plethysmograph. 4,141,346, Cl. 128-2.00T.

DeBolt, Harold E., to Avco Corporation. Carbon filament coated with boron and method of making same. 4,142,008, Cl. 427-249.000.

DeBruyne, Patrick: *See—*
Sittig, Roland; and DeBruyne, Patrick, 4,142,201, Cl. 357-38.000.

DeCrescente, Michael A.: *See—*
Bornstein, Norman S.; and DeCrescente, Michael A., 4,142,023, Cl. 428-680.000.

Deere & Company: *See—*
Miller, James A.; and Snyder, William L., 4,141,382, Cl. 137-596.150.

Deets, Gary L.; and Nemphos, Speros P., to Monsanto Company. Nitrogenous polymer composition emitting reduced amounts of hydrogen cyanide on combustion. 4,141,931, Cl. 260-876.00R.

DeFeo, Richard J.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,141,960, Cl. 423-417.000.

DeFord, Donald D.; and Clardy, Edwin K., to Phillips Petroleum Company. Pressure compensation method and apparatus for a chromatograph. 4,141,237, Cl. 73-23.100.

DeGraff, Clifford A., to Kaiser Aluminum & Chemical Corporation. Low headroom culvert. 4,141,666, Cl. 405-126.000.

de Jager, Andre: *See—*
Immel, Otto; de Jager, Andre; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,141,896, Cl. 260-239.30A.

de Jong, Eduard: *See—*
Hoss, Georg; and de Jong, Eduard, 4,141,869, Cl. 260-29.15B.

DeLaval Turbine Inc.: *See—*
Bachman, Albert J., 4,142,079, Cl. 200-84.00C.

De Leon, John N. Cover for display type refrigerating cabinet. 4,141,611, Cl. 312-116.000.

Delmon, Bernard: *See—*
Courty, Philippe; Ajot, Hubert; and Delmon, Bernard, 4,141,861, Cl. 252-462.000.

DeLuca, Carlo B., to Teledyne Penn-Union. Connector apparatus for joining an electrical bus with a transformer stud. 4,141,619, Cl. 339-267.000.

DeMarco, Alexander H. Ankle tape pack. 4,141,358, Cl. 128-166.000.

De Musis, Ralph T.: *See—*
Cretella, Salvatore J.; Bernardo, Matthew; and De Musis, Ralph T., 4,141,127, Cl. 29-156.80B.

Denier, Guy; Vayssiere, Pierre; Giroud, Georges; and Grosjean, Jean-Claude, to Institut de Recherches de la Siderurgie Francaise (IRSID). Process for producing stainless steel. 4,141,723, Cl. 75-60.000.

Denizman, Nejat H. Tennis serve training device. 4,141,550, Cl. 273-29.00A.

Denley, Brian W.: *See—*
Chiang, Alice M.; Denley, Brian W.; and Gelpey, Jeffrey C., 4,141,756, Cl. 148-1.500.

Dennison, Robert R., to Weiss Scientific Glass Blowing, Inc. Leader dispenser. 4,141,479, Cl. 225-38.000.

De Paulis, Tomas: *See—*
Carnmalm, Bernt S. E.; Lindberg, Ulf H. A.; De Paulis, Tomas; Ross, Svante B.; Stjernstrom, Nils-Erik; Ulff, Carl B. J.; and Ogren, Sven-Ove, 4,141,993, Cl. 424-330.000.

Deprez, Jacques: *See—*
Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, 4,141,800, Cl. 204-1.00T.

Deshaw, W. Rex: *See—*
Little, Carl H.; and Deshaw, W. Rex, 4,142,167, Cl. 335-190.000.

Deutsche Texaco Aktiengesellschaft: *See—*
Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, 4,141,867, Cl. 260-23.0AR.

deVries, Egbert, to QUAD Corporation. Condensation cleaning of exhaust gases. 4,141,702, Cl. 55-94.000.

De Wolf, Frank T.; and Kimberlin, Dan W., to General Electric Company. Method of making a permanent magnet field pole for a direct current dynamoelectric machine. 4,141,137, Cl. 29-596.000.

Diacon Inc.: *See—*
Rogers, Bryant C., 4,141,712, Cl. 65-36.000.

Diamond Power Specialty Corporation: *See—*
Piccirillo, David P., 4,141,614, Cl. 339-17.00F.

Diamond Shamrock Corporation: *See—*
Goble, Paul H., 4,142,042, Cl. 536-120.000.

Dichter, Wilhelm; Tatro, Henry J.; and Warner, C. Edward, to Colt Industries Operating Corp. Double action revolver apparatus and method. 4,141,165, Cl. 42-65.000.

Dickerson, George D.: *See—*
Dunbar, Joseph E.; Begin, Louis E.; Broesma, Robert J.; and Dickerson, George D., 4,141,983, Cl. 424-267.000.

Diehl GmbH & Co.: *See—*
Weidner, Peter F., 4,141,298, Cl. 102-210.000.

Diem, Clarence J. Retractable cord reel. 4,141,438, Cl. 191-12.400.

Diermayer, Werner. Draft control arrangement for combustion apparatus. 4,141,495, Cl. 236-1.00G.

Diersing, Raymond A.; Hackenbroch, Wilhelm T.; Schweikle, George E.; and Stanback, Harris I., to Square D Company. Improved panelboard assembly employing heat transmitting insulator assembly and a circuit breaker securing bead received in a circuit breaker housing recess. 4,142,225, Cl. 361-358.000.

Dieterich, Dieter; Markusch, Peter; and Reiff, Helmut, to Bayer Aktiengesellschaft. Inorganic-organic plastic. 4,142,030, Cl. 521-100.000.

Dietz Armaturen GmbH: *See—*
Rump, Martin, 4,141,507, Cl. 239-590.500.

Dietz, Henry G. Cup supporter for insertion into a garment. 4,141,357, Cl. 128-159.000.

Dietz, Karl-Heinz: *See—*
Thiel, Reinhard; Dietz, Karl-Heinz; Kerres, Hans; Rosenbaum, Heinz J.; and Steiner, Siegfried, 4,141,829, Cl. 210-63.00R.

Dietz, Raymond L., to AVX Corporation. Method of assembling a hermetically sealed semiconductor unit. 4,142,203, Cl. 357-80.000.

Digby, James B.: *See—*
Newson, John C.; Tregoning, Geoffrey R.; and Digby, James B., 4,141,179, Cl. 49-316.000.

Diguet, Daniel; and Gaffre, Michel, to U.S. Philips Corporation. Polychromatic monolithic semiconductor assembly. 4,142,196, Cl. 357-17.000.

Dilk, Larry W. Theft prevention device. 4,141,569, Cl. 280-507.000.

Diller, Ramik & Wight: *See—*
Glenn, Stephen J., 4,142,213, Cl. 358-221.000.

Dingwall, Andrew G. F., to RCA Corporation. Drain extensions for closed COS/MOS logic devices. 4,142,197, Cl. 357-23.000.

Dixon, Dale D.; and Ford, Michael E., to Air Products and Chemicals, Inc. Oxygen barrier laminate films including a polyalkylene carbonate adhesive. 4,142,021, Cl. 428-412.000.

Dixon, Guy E., to Panelfold, Inc. Multi-directional canted wheel carrier for operable walls. 4,141,106, Cl. 16-89.000.

Dmitriev, Nikolai S.: *See—*
Blagov, Evgeny E.; Panteleev, Anatoly I.; and Dmitriev, Nikolai S., 4,141,289, Cl. 100-212.000.

Dr. C. Otto & Comp. G.m.b.H: *See—*
Pries, Erich; and Wackerbarth, Folkard, 4,141,797, Cl. 201-41.000.

Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG.: *See—*
Schael, Wilfried; Sigdell, Jan-Erik; and Krick, Gerd E., 4,141,835, Cl. 210-321.00A.

Dohany, Julius E., to Pennwalt Corporation. Vinylidene fluoride polymer film-forming composition in aqueous dispersion. 4,141,873, Cl. 260-29.60F.

Dohi, Yuji: *See—*
Sato, Takefumi; and Dohi, Yuji, 4,141,597, Cl. 303-119.000.

Doino, Francis, Jr. Apparatus to protect the breathing of a horse. 4,141,199, Cl. 54-80.000.

Doll GmbH: *See—*
Kunz, Wilhelm; Posselt, Klaus; and Lohner, Manfred, 4,141,968, Cl. 424-48.000.
Kunz, Wilhelm; and Posselt, Klaus, 4,142,050, Cl. 544-322.000.

Dolly Toy Company, The: *See—*
Holtvoigt, John H., 4,141,156, Cl. 35-46.00A.

Dominion Foundries and Steel, Limited: *See—*
Glassman, Wayne C.; Melbourne, Sydney H.; Morson, Mary S.; and Soomet, Urmas, 4,141,758, Cl. 148-6.200.

Domrachev, Georgy A.; Khamylov, Vyacheslav K.; Bochkarev, Mikhail N.; Zhuk, Boris V.; Kaverin, Boris S.; Nesterov, Boris A.; and Kirilloy, Alexandr I. Method of preparing crystalline compounds $A^{IIIB^{VI}}$. 4,141,778, Cl. 156-613.000.

Domroe, William E.; Lindquist, Thomas W. F.; and Stern, Robert. Binding machine and cover for use therewith. 4,141,100, Cl. 11-1.0AD.

Domtar Inc.: *See—*
Lapointe, Joseph A., 4,141,451, Cl. 209-664.000.

Donnelly, Frank R. Convertible flatbed truck. 4,141,568, Cl. 280-415.00B.

Dorofeeva, Tatyana G.: *See—*
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Dorschner, Terry A.: *See—*
Smith, Irl W.; and Dorschner, Terry A., 4,141,651, Cl. 356-350.000.

Dorwart, William V., Jr.; and Brummund, Walter, Jr. Reference material for establishing anion concentrations in analytical chemistry tests. 4,141,856, Cl. 252-408.000.

Dow Chemical Company, The: *See—*
Bogan, Gary W., 4,141,865, Cl. 260-18.0EP.
Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., 4,142,005, Cl. 427-126.000.
Dunbar, Joseph E.; Begin, Louis E.; Broesma, Robert J.; and Dickerson, George D., 4,141,983, Cl. 424-267.000.
Goralski, Christian T.; and Burk, George A., 4,141,916, Cl. 260-556.0AR.
Moon, Tag Y.; and Cooper, Ronald H., 4,141,737, Cl. 106-12.000.
Strande, Carl S., 4,141,985, Cl. 424-273.00R.
Sun, Yun C., 4,141,924, Cl. 260-674.00R.

Dozier, Harold W., to Mostek Corporation. Series read only memory structure. 4,142,176, Cl. 340-166.00R.

Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG. Apparatebau: *See*—
Schael, Wilfried, 4,141,836, Cl. 210-321.00A.

Draber, Wilfried; Plempel, Manfred; Buchel, Karl H.; and Regel, Erik, to Bayer Aktiengesellschaft. Antimicrobial agent. 4,141,981, Cl. 424-263.000.

Dragoco Geberding & Co. GmbH: *See*—
Klein, Erich; Thomel, Frank; and Struwe, Hartmut, 4,142,053, Cl. 560-67.000.

Dresser Industries, Inc.: *See*—
Grubba, Donald C., 4,141,743, Cl. 106-66.000.

Drobich, Oleg P.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.

Drope, Eckard: *See*—
Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, 4,141,800, Cl. 204-1.00T.

Druminski, Manfred; and Gessner, Roland, to Siemens Aktiengesellschaft. Process for the production of extremely flat silicon troughs by selective etching with subsequent rate controlled epitaxial refill. 4,141,765, Cl. 148-175.000.

Dryden, Hugh L., Jr.; Scaros, Mike G.; and Westrich, John P., to G. D. Searle & Co. Process for the preparation of trimethylsulfoxonium bromide. 4,141,920, Cl. 260-607.00B.

DTPM Corporation: *See*—
Miller, Ralph, 4,141,961, Cl. 423-563.000.

Dual Gebruder Steidinger: *See*—
Laufer, Helmut, 4,142,217, Cl. 360-90.000.

DuBois, Richard, to Wagner Electric Corporation. Vacuum fluorescent display having uniform character brightness. 4,142,126, Cl. 313-497.000.

Dubost, Rene; and Grenat, Bernard, to Societe Anonyme dite: Les Cables de Lyon. Optical fibre cable and a method of manufacture. 4,141,623, Cl. 350-96.230.

Duchek, Ernest J., to Powers Regulator Co. Pneumatic thermostat. 4,141,496, Cl. 236-49.000.

Duff, Donald R.: *See*—
Barnett, James V.; Duff, Donald R.; and Wickwar, Larry D., 4,141,209, Cl. 58-23.00A.

Dugan, William P.; and Phillips, Eugene, to General Dynamics Corporation. Bump circuits on tape utilizing chemical milling. 4,141,782, Cl. 156-643.000.

Dumbeck, Robert F., to Rexnord Inc. Load indicating metering devices for motor driven loads. 4,141,244, Cl. 73-133.00R.

Dunbar, Joseph E.; Begin, Louis E.; Broesma, Robert J.; and Dickerson, George D., to Dow Chemical Company, The. Method for inhibiting ADP-induced platelet aggregation using phenylthioalkylamines. 4,141,983, Cl. 424-267.000.

Dunkelberger, David L., to Rohm and Haas Company. Thermoplastic film having improved outdoor weatherability. 4,141,935, Cl. 260-885.000.

Duparque, Daniel A.; Grange, Andre A.; Morin, Daniel L.; and Leclercq, Marius F., to Societe Nationale des Poudres et Explosifs. Fibre-reinforced metal panels and production thereof. 4,141,802, Cl. 204-15.000.

Du Pont de Nemours, E. I., and Company: *See*—
Brizzolara, Donald F.; and Honsberg, Wolfgang, 4,141,875, Cl. 260-29.70E.
Hamlin, James S., 4,142,194, Cl. 354-318.000.
Middleton, William J., 4,141,895, Cl. 260-239.30D.
Taylor, David C.; and Hayden, Mark W., 4,142,138, Cl. 318-542.000.

Dupuy, Georges; Daumas, Jean-Claude; and Michel, Max, to Rhone-Progil. Catalysts for treating gases containing sulphur compounds. 4,141,962, Cl. 423-571.000.

Duquenne, Claude E. D.; and Plotkowiak, Joseph, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Magnetic control closure system. 4,141,547, Cl. 277-80.000.

DuRocher, Gideon A., to Essex Group, Inc. Apparatus and method for terminating electrical conductors. 4,142,083, Cl. 219-58.000.

Duvochel, Henri P.; Kuhne, Roland E.; and Laurent, Bernard P., to International Business Machines Corporation. Multiplier accumulator. 4,142,242, Cl. 364-759.000.

Dye, Silas O., to ACF Industries, Incorporated. Carburetor fuel flow control. 4,141,940, Cl. 261-23.00A.

Dyhr, Jan; and Nissen, Ole J., to Danfoss A/S. Encapsulated refrigerator. 4,141,223, Cl. 62-469.000.

Dyke, Harry J.: *See*—
Landauer, Steven W.; and Dyke, Harry J., 4,142,070, Cl. 179-15.0BS.

Dynamit Nobel Aktiengesellschaft: *See*—
El-Chahawi, Moustafa; Prange, Uwe; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,141,915, Cl. 260-465.00D.

E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,142,045, Cl. 544-21.000.

Eastman Kodak Company: *See*—
Guild, John R., 4,141,733, Cl. 96-49.000.
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,141,884, Cl. 260-45.80N.
Newland, Gordon C.; Pacifici, James G.; and Young, David A., 4,141,808, Cl. 204-159.240.
Reid, Michael G.; and Rowell, Stephen R., 4,141,645, Cl. 355-3.0DD.
Schrader, Robert W.; and Carroll, John F., Jr., 4,141,735, Cl. 96-75.000.

Eastman Whipstock, Inc.: *See*—
Riordan, Mathew B.; and Lee, Arley G., 4,141,605, Cl. 308-26.000.

Eaton Corporation: *See*—
Hammond, Howard A.; and Sardina, John F., 4,141,257, Cl. 74-529.000.
Richards, Elmer A., 4,141,440, Cl. 192-53.00F.

Eaves, Ronald S., to Ernest Scragg & Sons Limited. Yarn texturing machine. 4,141,206, Cl. 57-290.000.

Ebara Manufacturing Co., Ltd.: *See*—
Mizuguchi, Saburo; Nomura, Isao; Naito, Takeyuki; Onodera, Masato; and Saito, Kouji, 4,141,785, Cl. 162-36.000.

Ebner, Albert; and Bauerle, Kurt, to Kuno Moser GmbH. Oral hygiene appliance. 4,141,352, Cl. 128-62.00A.

Eby, Arden T. Solar heating panel. 4,141,341, Cl. 126-271.000.

Eckersley, John: *See*—
Phillips, Reginald A.; Eckersley, John; and Hamilton, Terence, 4,141,594, Cl. 299-43.000.

Eckert, Robert C., to International Paper Company. Manganic ion delignification of lignocellulosic material. 4,141,786, Cl. 162-40.000.

Eda, Tadahiro; Mochizuki, Nobuo; and Nakagawa, Yukihiko, to Ricoh Company, Ltd. Developing electrode arrangement for electrophotographic apparatus. 4,141,643, Cl. 355-3.0DD.

Eddy, William C., Jr., to Aspro, Inc. Speed-responsive tag axle control system. 4,141,430, Cl. 180-105.00E.

Edeleanu Gesellschaft mbH: *See*—
Lassman, Josef; and Nuglisch, Herbert, 4,141,394, Cl. 141-284.000.

Edelstein, Franklin H.: *See*—
Breining, Franklin E.; and Edelstein, Franklin H., 4,141,608, Cl. 310-316.000.

Edwin Cooper and Company Limited: *See*—
Jayne, Gerald J. J.; and Askew, Herbert F., 4,141,846, Cl. 252-48.200.

Egorova, Tatyana S.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Eguchi, Toru: *See*—
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,142,235, Cl. 364-405.000.

Eidet, James H.: *See*—
Buchele, Wesley F.; Baldwin, William I.; Eidet, James H.; and Marley, Steven J., 4,141,419, Cl. 172-1.000.

Eimers, Erich: *See*—
Kraft, Klaus; and Eimers, Erich, 4,142,038, Cl. 528-288.000.

Eisert, Gerald A., to Central Research Laboratories, Inc. System for effecting access into sealed enclosures. 4,141,609, Cl. 312-1.000.

El-Chahawi, Moustafa; Prange, Uwe; Richtzenhain, Hermann; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing α-substituted cyanoacetic acid alkyl esters. 4,141,915, Cl. 260-465.00D.

Elektriska Svetsningsaktiebolaget: *See*—
Knipstrom, Karl-Erik; Malm, Anders L.; and Andersson, Bror H., 4,142,085, Cl. 219-61.000.

Elektro-Diesel, Firma: *See*—
Widegren, Lars H.; and Keskitalo, Tage O., 4,141,398, Cl. 144-309.0AC.

Eli, John C., Jr. Protecting device for containers. 4,141,459, Cl. 220-85.00K.

Eli Lilly and Company: *See*—
Greene, James M.; Schildcrout, Sigmund A.; and Zintgraff, Gary D., 4,142,059, Cl. 562-606.000.
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,141,907, Cl. 260-345.70R.
Ward, John S., 4,141,984, Cl. 424-270.000.
Zimmerman, Dennis M., 4,141,893, Cl. 260-239.0BB.
Zimmerman, Dennis M., 4,141,894, Cl. 260-239.0BB.

Elkem-Spigerverket A/S: *See*—
Anderssen, Tore; and Larsen, Kjell, 4,141,945, Cl. 264-63.000.

Elkina, Alla K.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Ellegast, Konrad: *See*—
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.

Ellens, Gordon A., to U.S. Industries, Inc. Seat belt assembly connection and method for fabricating. 4,141,573, Cl. 280-744.000.

Ellington, Kenneth L., to Koni B.V. Hydraulic shock absorber with out-of-limit indicator. 4,141,236, Cl. 73-11.000.

Elliott Brothers (London) Limited: *See*—
Glenn, Stephen J., 4,142,213, Cl. 358-221.000.

Elliott, David G.: *See*—
United States of America, National Aeronautics and Space Administration; and Elliott, David G., 4,141,219, Cl. 60-645.000.

Ellwood, George; and Dalgoutte, David G., to International Standard

Electric Corporation. Optical fibre splice jig. 4,141,776, Cl. 156-502.000.

Elmes Staub & Co., AG: *See—*
Hepper, Peter; and Steiner, Willy, 4,141,662, Cl. 400-194.000.

Elsasser, Friedrich W.: *See—*
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.

Emerson, Ralph W.; and Martin, Jerome L., to Plasmine Corporation, The. Ammonia containing rosin sizes. 4,141,750, Cl. 106-218.000.

Emerson, Terence P.: *See—*
Wieland, Kurt H.; Noe, James C.; and Emerson, Terence P., 4,141,672, Cl. 415-202.000.

Emery Industries, Inc.: *See—*
Foulks, Harold C., Jr., 4,141,866, Cl. 260-23.0XA.

EMI Electrola Gesellschaft mit beschrankter Haftung: *See—*
Strausfeld, Hermann, 4,141,531, Cl. 249-80.000.

Eminger, Harry E., to Westinghouse Electric Corp. Swing check valve. 4,141,381, Cl. 137-527.200.

Emmons, Conant H. Bicycle. 4,141,630, Cl. 352-132.000.

Emmons, William D.; and Nyi, Kayson, to Rohm and Haas Company. Water-based coating compositions. 4,141,868, Cl. 260-23.0AR.

Endo Laboratories Inc.: *See—*
Berger, Joel G., 4,141,980, Cl. 424-256.000.

Endriz, John G., to RCA Corporation. Image display device with optical feedback to cathode. 4,142,123, Cl. 313-400.000.

Engel, David J., to Raymond International, Inc. Method and apparatus for erecting a bridge structure. 4,141,668, Cl. 405-202.000.

Engel, William K., to Caterpillar Tractor Co. Combination shuttle and high-pressure relief valve. 4,141,216, Cl. 60-454.000.

Engstrom, Anders, to Victor Hasselblad AB. Lamp changing system for projectors. 4,142,129, Cl. 315-89.000.

Ennulat, Reinhard D., to United States of America, Army. Pyroelectric solid state imager. 4,142,206, Cl. 358-113.000.

Entreprises d'Equipements Mecaniques et Hydrauliques E.M.M.: *See—*
Tuson, Samuel, 4,141,221, Cl. 29-450.000.

Eratov, Leonid K.: *See—*
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Erckel, Rudiger: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,142,044, Cl. 542-464.000.

Erdmann, Jurgen, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Method for producing a switching signal on the passage of a contrast jump. 4,142,105, Cl. 250-548.000.

Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., to Brunswick Corporation. Ceramic-metal laminate. 4,142,022, Cl. 428-432.000.

Ernest Scragg & Sons Limited: *See—*
Eaves, Ronald S., 4,141,206, Cl. 57-290.000.

Ernill, Richard J.: *See—*
Davies, David H.; Ernill, Richard J.; and Norris, Geoffrey L. F., 4,141,974, Cl. 424-181.000.

Ersfeld, Heinrich: *See—*
Schulte, Klaus; and Ersfeld, Heinrich, 4,141,470, Cl. 222-137.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Erdmann, Jurgen, 4,142,105, Cl. 250-548.000.

Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and device for plasma MIG welding. 4,142,090, Cl. 219-121.00P.

Essex Group, Inc.: *See—*
DuRocher, Gideon A., 4,142,083, Cl. 219-58.000.

Estabrook, Lawrence E.: *See—*
Marion, Charles P.; Estabrook, Lawrence E.; and Richter, George N., 4,141,695, Cl. 48-197.00R.
Marion, Charles P.; Estabrook, Lawrence E.; and Richter, George N., 4,141,696, Cl. 48-197.00R.

Esteban, Daniel: *See—*
Croisier, Alain; Esteban, Daniel; and Galand, Claude, 4,142,071, Cl. 179-15.55R.

Etablissement Public dit "Agence Nationale de Valorisation de la Recherche (ANVAR)": *See—*
Lucas, Jacques; Poulain, Michel; and Poulain, Marcel, 4,141,741, Cl. 106-47.00Q.

Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,141,087, Cl. 3-1.000.

Ethyl Corporation: *See—*
Bergeron, Charles R., 4,141,937, Cl. 260-927.00N.

Evans, Mack N.; and Burnett, James D. Insecticidal collar for animals. 4,141,322, Cl. 119-106.000.

Evers, Robert C.; and Abraham, Tonson, to United States of America, Air Force. Readily curable fluorocarbon ether bibenzoxazole polymers. 4,142,037, Cl. 528-210.000.

Everton, Irving M. Game apparatus for use in conjunction with the viewing of a spectator's sport. 4,141,548, Cl. 273-1.00E.

Ewan, Thomas K.; Bass, Malley R.; Means, Jennings D.; Frier, James L.; and Holland, Orvis L., to Lone Star Steel Company. Apparatus and process for the removal of pollutant material from gas streams. 4,141,701, Cl. 55-90.000.

Ewen, Douglas G.: *See—*
Campbell, John M.; Ball, Herbert L.; Bymoen, Darrell A.; Ewen, Douglas G.; Hise, Ronald D.; Stribley, Charles R.; and West, Gaylon L., 4,141,295, Cl. 102-10.000.

Exxon Research & Engineering Co.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,141,960, Cl. 423-417.000.
McVicker, Gary B.; and Garten, Robert L., 4,141,817, Cl. 208-139.000.

Fa. Weber Lichtsteuergerate KG.: *See—*
Weber, Rudolf, 4,142,110, Cl. 307-237.000.

Fabio, Paul F.: *See—*
Lang, Stanley A., Jr.; Lin, Yang-I; Fields, Thomas L.; Fabio, Paul F.; and Murdock, Keith C., 4,141,992, Cl. 424-326.000.

Fachbach, Heinz: *See—*
Kirchweger, Karl; Fachbach, Heinz; and Thien, Gerhard, 4,141,427, Cl. 180-69.00R.

Fairchild Camera and Instrument Corporation: *See—*
Barnett, James V.; Duff, Donald R.; and Wickwar, Larry D., 4,141,209, Cl. 58-23.00A.

Falconi, Giovanni: *See—*
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, 4,141,899, Cl. 546-118.000.

Fansteel Inc.: *See—*
Hakko, James B., 4,141,719, Cl. 75-0.5BB.

Faroudja, Yves C., to Microtime, Inc. Bidimensional noise reduction system for television. 4,142,211, Cl. 358-167.000.

Farrell, Thurlow. Hinge support assembly. 4,141,109, Cl. 16-137.000.

Faust, Clifford C.; and Mettler, Mark F., to Union Carbide Corporation. Disposable food package. 4,141,487, Cl. 229-43.000.

Februder Junghans GmbH: *See—*
Flaig, Hans, 4,141,210, Cl. 58-23.00D.

Federici, Federico: *See—*
Martini, Alessandro; Federici, Federico; and Argenti, Benito, 4,141,791, Cl. 195-66.00R.

Fedorov, Oleg G.: *See—*
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.

Feiken, Jakob: *See—*
Kulberg, Gerardus H.; Feiken, Jakob; and Freek, Siebe A., 4,141,444, Cl. 198-472.000.

Feinleib, Julius M., to Adaptive Optics Associates, Inc. Sensor system for detecting wavefront distortion in a return beam of light. 4,141,652, Cl. 356-121.000.

Feinstein, Allen I.; and Fields, Ellis K., to Standard Oil Company (Indiana). Polyphenylcarboxylic acid adamantane compounds and polymers prepared therefrom. 4,142,036, Cl. 528-183.000.

Feld, Fritz: *See—*
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck. Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.

Feldman, Daniel W.; Sprague, James W.; and Veatch, Franklin, to Standard Oil Company (Ohio). Manganese containing fuels. 4,141,693, Cl. 44-68.000.

Feller, Murray D.: *See—*
Klassen, George; and Feller, Murray D., 4,141,147, Cl. 33-174.00N.

Felten & Guilleaume Carlswerk AG: *See—*
Braun, Dieter, 4,141,952, Cl. 264-251.000.

Ferguson, Andrew M.; Keith, Ernest V.; and Hatchell, David C., to Reme Enterprises, Inc.; and National Patent Search Associates, Inc. Increased mobility apparatus for the disabled. 4,141,094, Cl. 5-81.00R.

Fernandez, Ramon J.; and Kahl, John S., to Brown & Root, Inc. Underwater storage assembly. 4,141,377, Cl. 137-236.000.

Ferreira, Lloyd A., to Med Telectronics Ltd. Cardiac electrode/pacer system analyzer. 4,141,367, Cl. 128-419.0PT.

Ferrini, Pier G.: *See—*
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,141,982, Cl. 424-267.000.

Ferris, Ray L.: *See—*
Marulic, Walter J.; and Ferris, Ray L., 4,141,300, Cl. 105-368.00S.

Fesler, John: *See—*
Jenkins, John P.; and Fesler, John, 4,142,221, Cl. 361-151.000.

Feucht, Dennis D., to Caterpillar Tractor Co. Multiple input, single output mechanical actuator. 4,141,220, Cl. 60-698.000.

Fields, Ellis K.: *See—*
Feinstein, Allen I.; and Fields, Ellis K., 4,142,036, Cl. 528-183.000.

Fields, Thomas L.: *See—*
Lang, Stanley A., Jr.; Lin, Yang-I; Fields, Thomas L.; Fabio, Paul F.; and Murdock, Keith C., 4,141,992, Cl. 424-326.000.

Fincher, David J., to Westinghouse Brake and Signal Company Limited. Sensing arrangements. 4,142,152, Cl. 324-165.000.

Fink, Ronald P.: *See—*
Hedlund, Lee V.; Fink, Ronald P.; and Wright, David L., 4,142,209, Cl. 358-128.000.

Finnila, Ronald M.; and Su, Stephen C., to Hughes Aircraft Company. Monolithic extrinsic silicon infrared detectors with an improved charge collection structure. 4,142,198, Cl. 357-24.000.

Fischell, Robert E.; and Powell, William R., to Johns Hopkins University, The. Epidural lead electrode and insertion needle. 4,141,365, Cl. 128-404.000.

Fischer, Charles F.; and Joshi, David P., to Colgate-Palmolive Com-

pany. Continuous process for making variegated soap. 4,141,947, Cl. 264-75.000.
Fischer, John J., to Harsco Corporation. Blending apparatus. 4,141,657, Cl. 366-232.000.
Fisher, Alan J. Digital code reader. 4,141,494, Cl. 235-449.000.
Fisher, Robert D.: *See—*
Brandt, Robert W.; Fisher, Robert D.; and Hill, James E., 4,142,238, Cl. 364-552.000.
Fisher Scientific Company: *See—*
Louder, Nevitt M.; and Cuomo, Carlo E., 4,141,312, Cl. 118-7.000.
Fisons Limited: *See—*
Cronin, Christopher H., 4,141,716, Cl. 71-90.000.
Fitch, John C. Fireplace stove. 4,141,336, Cl. 126-121.000.
Flaig, Hans, to Februder Junghans GmbH. Bipolar stepping motor. 4,141,210, Cl. 58-23.00D.
Flanagan, Joseph E.; Frankel, Milton B.; and Witucki, Edward F., to Rockwell International Corporation. Azido compounds. 4,141,910, Cl. 260-349.000.
Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., to Mattel, Inc. Posable doll, means for movably mounting same and toy camera. 4,141,176, Cl. 46-116.000.
Flinchbaugh Products, Inc.: *See—*
Abel, Eugene K.; and Shupp, Jack K., 4,141,279, Cl. 90-11.00C.
Floury, Yves: *See—*
Boniort, Jean-Yves; Brehm, Claude; and Floury, Yves, 4,142,063, Cl. 13-27.000.
FMC Corporation: *See—*
Treytl, William J.; Slemmons, Arthur J.; and Andeen, Gerry B., 4,141,626, Cl. 350-295.000.
Watson, Roy O., 4,141,104, Cl. 16-65.000.
Ford, Michael E.: *See—*
Dixon, Dale D.; and Ford, Michael E., 4,142,021, Cl. 428-412.000.
Formica Corporation: *See—*
Bunkowski, Kenneth D., 4,141,872, Cl. 260-29.40R.
Forrest, Gordon C.; Jay, Ronald F.; and Clements, John A., to Technicon Instruments Corporation. Automatic apparatus and method for the assay of fluid samples. 4,141,687, Cl. 23-230.00R.
Foseco Trading AG.: *See—*
Wukovich, Nick, 4,141,406, Cl. 164-359.000.
Foseco Trading A.G.: *See—*
Akiyama, Takayuki, 4,141,769, Cl. 149-40.000.
Fosher, Donald H. Artificial fishing lures and process for molding same. 4,141,170, Cl. 43-42.240.
Fosroc International Limited: *See—*
Kyte, Colin T.; Lewis, Geoffrey J.; Pearce, Edgar; and Hume, Keith, 4,142,009, Cl. 427-297.000.
Foster-Miller Associates, Inc.: *See—*
Pompei, Francesco, 4,141,329, Cl. 123-139.00B.
Foulks, Harold C., Jr., to Emery Industries, Inc. Soaps and ester-soaps of α-alkyl branched monocarboxylic acids. 4,141,866, Cl. 260-23.0XA.
Foundry Technology, Inc.: *See—*
McMullen, Carl R., 4,141,404, Cl. 164-4.000.
Fourne, Franz; and Fourne, Ursula. Method and apparatus for cutting textile tow into staple. 4,141,115, Cl. 19-.600.
Fourne, Ursula: *See—*
Fourne, Franz; and Fourne, Ursula, 4,141,115, Cl. 19-.600.
Franchina, Antonino. Heating system. 4,141,490, Cl. 237-2.00B.
Francis, Terry M., to Adirondack Steel Specialties, a division of Adirondack Steel Casting Co., Inc. Construction of a hammer for hammer mill. 4,141,512, Cl. 241-194.000.
Frankel, Milton B.: *See—*
Flanagan, Joseph E.; Frankel, Milton B.; and Witucki, Edward F., 4,141,910, Cl. 260-349.000.
Franzmair, Rudolf, to Chemie Linz Aktiengesellschaft. Arylaminoimidazoline derivatives. 4,142,051, Cl. 548-315.000.
Frauenfeld, Martin, to Svenska Rotor Maskiner Aktiebolag. Apparatus and method for cleaning the heat exchanging surfaces of the heat transfer plates of a rotary regenerative heat exchanger. 4,141,754, Cl. 134-24.000.
Freek, Siebe A.: *See—*
Kulberg, Gerardus H.; Feiken, Jakob; and Freek, Siebe A., 4,141,444, Cl. 198-472.000.
Freeman, Jerry H., to Unarco Industries, Inc. Light fixture. 4,141,617, Cl. 339-97.00L.
Freilich, Arthur; and Kalron, Avraham, to North Atlantic Industries, Inc. Harmonic insensitive phase sensitive demodulator. 4,142,241, Cl. 364-724.000.
Freitag, Dieter: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,142,035, Cl. 528-177.000.
Freund, Robert W., to Veripen, Inc. Control signal apparatus for CATV system. 4,142,156, Cl. 325-309.000.
Frey, Daniel J., to General Electric Company. Digital servovalve drive. 4,141,376, Cl. 137-83.000.
Friedman, Barry A.: *See—*
MacVane, Thomas S.; Lindbergh, Jon M.; and Friedman, Barry A., 4,141,318, Cl. 119-3.000.
Friend, Donald L.; Grosko, John A.; and Lanyi, Ernest S., to United States Steel Corporation. Dumping railway quench car. 4,141,299, Cl. 105-260.000.
Frier, James L.: *See—*
Ewan, Thomas K.; Bass, Malley R.; Means, Jennings D.; Frier, James L.; and Holland, Orvis L., 4,141,701, Cl. 55-90.000.
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and by Zelichenko, Faina S., administrator. Method and apparatus for complex continuous processing of polymetallic raw materials. 4,141,721, Cl. 75-14.000.
Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, to Deutsche Texaco Aktiengesellschaft. Cold cross-linking dispersion adhesive. 4,141,867, Cl. 260-23.0AR.
Fuhrer, Robert: *See—*
Berges, Dietrich; Saam, Ulrich; Fuhrer, Robert; and Damzog, Bodo, 4,141,205, Cl. 57-58.320.
Fuji Electric Company, Ltd.: *See—*
Fumihiko, Takezoe; and Omori, Shigeru, 4,142,246, Cl. 364-900.000.
Fuji Kiko Kabushiki Kaisha: *See—*
Yamanashi, Chusaku, 4,141,518, Cl. 242-107.40A.
Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,141,132, Cl. 29-432.000.
Fuji Photo Film Co., Ltd.: *See—*
Aonuma, Masashi; Tamai, Yasuo; Kitamoto, Tatsuji; and Kodama, Fumio, 4,141,763, Cl. 148-105.000.
Minagawa, Yoshisato; Arai, Naoki; and Ueda, Takehiko, 4,141,730, Cl. 96-9.000.
Fuji Photo Optical Co., Ltd.: *See—*
Asano, Seiji; and Hosono, Tsutomu, 4,141,635, Cl. 354-173.000.
Fujishiro, Takeshi: *See—*
Kita, Toru; and Fujishiro, Takeshi, 4,141,813, Cl. 204-195.00S.
Fujishita, Toshio: *See—*
Hirai, Kentato; Fujishita, Toshio; Ishiba, Teruyuki; and Sugimoto, Hiroshiko, 4,141,901, Cl. 260-308.00R.
Fujita, Kazuya, to Shinko Electric Co., Ltd. Fork lift truck with balance weight using batteries as power source. 4,142,135, Cl. 318-139.000.
Fukatani, Yasunobu, to Kabushiki Kaisha Daikin Seisakusho. Release assistor of a friction clutch. 4,141,441, Cl. 192-70.250.
Fukumori, Yoshiki: *See—*
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, 4,141,214, Cl. 60-276.000.
Fukuoka Tokushugarasu Kabushiki Kaisha: *See—*
Nakajima, Nobuyuki, 4,141,742, Cl. 106-47.00R.
Fukutomi, Yoshiaki: *See—*
Nakazawa, Itta; Kada, Isamu; and Fukutomi, Yoshiaki, 4,141,082, Cl. 2-93.000.
Fumihiko, Takezoe; and Omori, Shigeru, to Fuji Electric Company, Ltd. Sequence controller with dynamically changeable program. 4,142,246, Cl. 364-900.000.
Funaro, Giampaolo, to Primark AG. Flexible composite container for dispensing materials in paste form. 4,141,468, Cl. 222-105.000.
Furman, Edward R.: *See—*
Alger, Donald L.; Schwab, William B.; and Furman, Edward R., 4,141,224, Cl. 62-514.00R.
Fusee, Murray C.: *See—*
Levy, Joseph; and Fusee, Murray C., 4,141,857, Cl. 252-430.000.
G. D. Searle & Co.: *See—*
Dryden, Hugh L., Jr.; Scaros, Mike G.; and Westrich, John P., 4,141,920, Cl. 260-607.00B.
Kulberg, Gerardus H.; Feiken, Jakob; and Freek, Siebe A., 4,141,444, Cl. 198-472.000.
G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,141,265, Cl. 83-169.000.
G. L. Collins Corporation: *See—*
Arce, Luis A., 4,142,142, Cl. 324-54.000.
Gaertner, Rudolph F., to Tandy Brands, Inc. Reversible stirrup leather buckle. 4,141,198, Cl. 54-46.000.
GAF Corporation: *See—*
Mestetsky, Thomas S., 4,142,014, Cl. 428-40.000.
Newson, David C., 4,141,314, Cl. 118-246.000.
Gaffre, Michel: *See—*
Diguet, Daniel; and Gaffre, Michel, 4,142,196, Cl. 357-17.000.
Gainey, Russell H. Aquatic debris removing system. 4,141,308, Cl. 114-270.000.
Gaitten, Ronald E.; and Smith, Gerald L., to International Business Machines Corporation. Photoconductor charging technique. 4,141,648, Cl. 355-14.000.
Galand, Claude: *See—*
Croisier, Alain; Esteban, Daniel; and Galand, Claude, 4,142,071, Cl. 179-15.55R.
Galos, Imre: *See—*
Swanson, William C.; and Galos, Imre, 4,141,283, Cl. 91-461.000.
Gangnath, Robert B., to Sperry Rand Corporation. Hair roller. 4,141,371, Cl. 132-40.000.
Gardner, Benjamin R. Under reamer. 4,141,421, Cl. 175-263.000.
Garner, James K., Jr.: *See—*
Morris, Arthur J.; and Garner, James K., Jr., 4,141,413, Cl. 166-120.000.
Garnett, Jack V., to Rheem Manufacturing Company. Supplementary heat control for heat pump system. 4,141,408, Cl. 165-29.000.
Garrett Corporation, The: *See—*
Wieland, Kurt H.; Noe, James C.; and Emerson, Terence P., 4,141,672, Cl. 415-202.000.
Garrett, Michael E.: *See—*
Smith, Kenneth C.; and Garrett, Michael E., 4,141,823, Cl. 210-17.000.
Garrod and Lofthouse Limited: *See—*
Cliffe, Ian, 4,141,446, Cl. 206-387.000.

Garten, Robert L.: *See—*
McVicker, Gary B.; and Garten, Robert L., 4,141,817, Cl. 208-139.000.

Garziera, Gastone; and Pisani, Federico, to Ing. C. Olivetti & C., S.p.A. Programmable electronic computer. 4,142,244, Cl. 364-900.000.

Gates, Allan L.: *See—*
Benes, David M.; Gates, Allan L.; and Ryan, Richard, 4,141,566, Cl. 280-16.000.

Gavrilenko, Alexandr F.: *See—*
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Gay, Derek J.: *See—*
Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., 4,141,176, Cl. 46-116.000.
Wilson, Nicol S.; Hunter, Gary L.; and Gay, Derek J., 4,141,256, Cl. 74-64.000.

Gay, John C.; and Marsland, William P., to Cutter Laboratories, Inc. Equine parasiticide paste. 4,141,975, Cl. 424-217.000.

Gdanski, Ronald C. Vibratory coin feeder. 4,141,372, Cl. 133-1.00R.

Gebruder Kommerling Kunststoffwerke G.m.b.H.: *See—*
Anstadt, Gerd L.; and Kesseler, Helmut, 4,141,944, Cl. 264-45.500.

Geimer, Josef, to Turke & Bolte. Outlet fixture for fluid media. 4,141,383, Cl. 137-606.000.

Geis, David G.; and Hodne, Ingard B., to Teletype Corporation. Guide system for wire matrix printing. 4,141,661, Cl. 400-124.000.

Gelhaar, Hans G.: *See—*
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.

Gelpey, Jeffrey C.: *See—*
Chiang, Alice M.; Denley, Brian W.; and Gelpey, Jeffrey C., 4,141,756, Cl. 148-1.500.

General Atomic Company: *See—*
Ohkawa, Tihiro, 4,141,805, Cl. 204-157.10H.

General Dynamics Corporation: *See—*
Couchman, James C., 4,142,154, Cl. 324-219.000.
Dugan, William P.; and Phillips, Eugene, 4,141,782, Cl. 156-643.000.

General Electric Company: *See—*
Abrams, Donald W., 4,142,092, Cl. 219-218.000.
Cline, Harvey E.; and Anthony, Thomas R., 4,141,757, Cl. 148-1.500.
Darby, William L.; Monz, Robert H.; and Molis, Stephen J., 4,141,669, Cl. 408-1.00R.
De Wolf, Frank T.; and Kimberlin, Dan W., 4,141,137, Cl. 29-596.000.
Frey, Daniel J., 4,141,376, Cl. 137-83.000.
Greskovich, Charles D.; and Borom, Marcus P., 4,141,781, Cl. 156-637.000.
Hansen, Wilbur O., 4,142,151, Cl. 324-158.00D.
Hudson, Barry L., 4,141,473, Cl. 222-473.000.
Lange, Kai, 4,142,102, Cl. 250-369.000.
Laskow, William; and Morelock, Charles R., 4,141,948, Cl. 264-101.000.
Shaw, David G., 4,142,223, Cl. 361-319.000.
Taylor, Benson T., Jr., 4,141,311, Cl. 116-227.000.
White, Dwain M.; and Matthews, Robert O., 4,141,927, Cl. 260-857.0PA.

General Foods Corporation: *See—*
Spotholz, Clifford H.; Scarsella, Edward L.; and Yadlowsky, Slawko, 4,142,002, Cl. 426-595.000.

General Mills Chemicals, Inc.: *See—*
Best, Roland W., 4,141,747, Cl. 106-210.000.

General Motors Corporation: *See—*
Ross, Phillip T., 4,141,213, Cl. 60-39.670.

General Scanning, Inc.: *See—*
Rohr, Bruce E., 4,142,144, Cl. 324-61.00R.

Gense, Johannes P., to Koninklijke Nederlandse Papierfabrieken N.W. Centrifuge. 4,141,488, Cl. 233-7.000.

George, Harvey F.; Marrara, Charles G.; and Oppenheimer, Robert H., to Gravure Research Institute, Inc. Portable comparator gage for measuring the relative deviation in the diameter of cylinders. 4,;41,149, Cl. 33-178.00D.

Georgia Tech Research Institute: *See—*
Bridger, Grover L., 4,141,958, Cl. 43-167.000.

Gerber, Robert L., to United States of America, Navy. Weather modification automatic cartridge dispenser. 4,141,274, Cl. 89-1.50R.

Gessner, Roland: *See—*
Druminski, Manfred; and Gessner, Roland, 4,141,765, Cl. 148-175.000.

Gibellina, Michael C. Self propelled drivehead for automatic swimming pool cleaner. 4,141,101, Cl. 15-1.700.

Gibson, William A.: *See—*
Bishop, Richard L.; and Gibson, William A., 4,142,243, Cl. 364-900.000.

Giddings & Lewis, Inc.: *See—*
Zettler, William D.; Woytych, Edward F.; Seichter, Daniel J.; and Schmidt, Frederick L., 4,141,134, Cl. 29-568.000.

Gierek, Adam; Bajka, Lech; and Machnicka, Malgorzata, to Politechnika Slaska im. Wincentego Pstrowskiego. Method of producing coatings of copper alloy on ferrous alloys. 4,142,011, Cl. 427-431.000.

Gilbert, John E. Device and kit and method for measuring the degree of doneness of a cooked piece of meat. 4,141,239, Cl. 73-81.000.

Gilbert, Raymond D. Valve train systems of internal combustion engines. 4,141,333, Cl. 123-198.00F.

Gill, Gerald L., Jr.; and Rioux, Philip J., to Kayex Corporation. Polishing apparatus. 4,141,180, Cl. 51-5.00R.

Giove, John L.: *See—*
Brickner, Kenneth G.; and Giove, John L., 4,141,724, Cl. 75-126.00D.

Giroud, Georges: *See—*
Denier, Guy; Vayssiere, Pierre; Giroud, Georges; and Grosjean, Jean-Claude, 4,141,723, Cl. 75-60.000.

Givens, Edwin N.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,141,859, Cl. 252-455.00Z.

Glabe, Elmer F.: *See—*
Ziemke, William H.; and Glabe, Elmer F., 4,141,998, Cl. 426-99.000.

Glassman, Wayne C.; Melbourne, Sydney H.; Morson, Mary S.; and Soomet, Urmas, to Dominion Foundries and Steel, Limited. Compositions and processes for producing chromium conversion coatings on surfaces of zinc/iron alloy. 4,141,758, Cl. 148-6.200.

Gleason, Joseph P., to Magnavox Company, The. Radar system. 4,142,189, Cl. 343-9.000.

Glen Raven Mills, Inc.: *See—*
Trifunovic, Alexander L., 4,141,121, Cl. 28-271.000.
Trifunovic, Alexander L., 4,141,122, Cl. 28-271.000.

Glenn, Stephen J., to Diller, Ramik & Wight; and Elliott Brothers (London) Limited. Apparatus for elimination of dark current utilizing charge coupled devices. 4,142,213, Cl. 358-221.000.

GNT Automatic A/S: *See—*
Thellufsen, Jorn; and Nielsen, Niels E. M., 4,141,491, Cl. 234-115.000.

Goble, Paul H., to Diamond Shamrock Corporation. Alkenyl ethers from high molecular weight polyols. 4,142,042, Cl. 536-120.000.

Goegelman, Robert T.: *See—*
Cassidy, Patrick J.; Goegelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,141,986, Cl. 424-274.000.

Goetze AG: *See—*
Leutgab, Hermann, 4,141,2[illegible]3, Cl. 82-45.000.

Goga, Atsushi; Ikui, Takefumi; Obi, Mikio; and Kameda, Shinya, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Oval shaped valve with balancing pilot piston. 4,141,534, Cl. 251-58.000.

Goi, Hitoshi: *See—*
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.

Goldner, Walther; and Wall, Helmut, to Recaro GmbH & Co. Vehicle seat. 4,141,586, Cl. 297-191.000.

Golovachev, Anatoly I.: *See—*
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Gomyo, Shiro: *See—*
Ariga, Kinji; and Gomyo, Shiro, 4,141,926, Cl. 260-824.0EP.

Gonon, Jean A. P. Carrier ring for drapery rod. 4,141,105, Cl. 16-87.60R.

Gony, Jean-Noel M.: *See—*
Clin, Francois H.; Gony, Jean-Noel M.; and Proust, Francois O., 4,141,450, Cl. 209-3.100.

Goodman, Robert B., to United Technologies Corporation. Hydraulically operated shutoff valve. 4,141,533, Cl. 251-58.000.

Goodwin, Roy D.: *See—*
Blackburn, William A.; and Goodwin, Roy D., 4,142,017, Cl. 428-284.000.

Goodyear Tire & Rubber Company, The: *See—*
Hogan, James M.; and White, John R., 4,141,852, Cl. 252-182.000.

Goralski, Christian T.; and Burk, George A., to Dow Chemical Company, The. 3,4,5-Trichloro-N,N-Di(loweralkyl)-2-((chloromethyl)-thio)benzenesulfonamides. 4,141,916, Cl. 260-556.0AR.

Goransson, Gunnar P. M. Racket. 4,141,551, Cl. 273-73.00G.

Gordon, Bernard M., to Analogic Corporation. Logarithmic analog-to-digital converter. 4,142,185, Cl. 340-347.0AD.

Gordon, Robert L.; Naugle, George H.; and Cooper, Keith A., to International Paper Company. Container for storing food. 4,141,466, Cl. 220-462.000.

Gorter, Frederik W., to U.S. Philips Corporation. Magnetoresistive head. 4,142,218, Cl. 360-113.000.

Goshima, Takeshi; and Ohta, Shoji, to Canon Kabushiki Kaisha. Light deflecting device using a polygon mirror with float members. 4,141,620, Cl. 350-6.800.

Goss, Stanley B.; Nagel, Martin J.; and Nilssen, Ole K., to Tenna Corporation. Aural-visual product display. 4,142,216, Cl. 360-72.000.

Gottel, Heinz. Wire-fastening mechanism. 4,141,389, Cl. 140-93.00A.

Gottlieb, Ellis J., to Motorola, Inc. Unitized connector arrangement for electrical apparatus. 4,141,616, Cl. 339-75.00M.

Gould, James S.; and Gould, Samuel, to Indicator Controls Corporation. Mounting bracket assembly for traffic signals and pedestrian signal units. 4,142,173, Cl. 340-119.000.

Gould, Samuel: *See—*
Gould, James S.; and Gould, Samuel, 4,142,173, Cl. 340-119.000.

Grabmaier, Josef: *See*—
Aulich, Hubert; Pink, Hans; and Grabmaier, Josef, 4,141,710, Cl. 65-3.00A.

Gragnani, Nelson A., to Pandrol Limited. Railway tie plate and a method of making a railway tie plate. 4,141,500, Cl. 238-304.000.

Graham, William J., to Texaco Inc. Ball type valve with high pressure sealing capability. 4,141,536, Cl. 251-161.000.

Grange, Andre A.: *See*—
Duparque, Daniel A.; Grange, Andre A.; Morin, Daniel L.; and Leclercq, Marius F., 4,141,802, Cl. 204-15.000.

Graversen, Niels P. G.: *See*—
Valbjorn, Knud V.; and Graversen, Niels P. G., 4,141,497, Cl. 236-51.000.

Graves, Robert J. Roofing and surfacing material and method. 4,141,187, Cl. 52-173.00R.

Gravure Research Institute, Inc.: *See*—
George, Harvey F.; Marrara, Charles G.; and Oppenheimer, Robert H., 4,141,149, Cl. 33-178.00D.

Gray, Douglas R.: *See*—
Cross, Thomas E., Jr.; and Gray, Douglas R., 4,141,366, Cl. 128-418.000.

Gray, John W., to Timex Corporation. Crystal oscillator. 4,142,161, Cl. 331-116.00R.

Green, Philip S.; Schaefer, Louis F.; Taenzer, Jon C.; Holzemer, John F.; Ramsey, S. David, Jr.; and Suarez, Joe R., to SRI International. Real-time ultrasonic B-scan imaging and Doppler profile display system and method. 4,141,347, Cl. 128-2.00V.

Green, Robert S., to Mostek Corporation. Integrated circuit with threshold regulation. 4,142,114, Cl. 307-304.000.

Greene, James M.; Schildcrout, Sigmund A.; and Zintgraff, Gary D., to Eli Lilly and Company. Spray drying sodium and potassium 2-ethylhexanoate. 4,142,059, Cl. 562-606.000.

Greenhalgh, Colin W.; and Newton, David F., to Imperial Chemical Industries Limited. Transfer dyeing with 1-hydroxy-2-alkyl-4-anilino anthraquinone dyes. 4,141,682, Cl. 8-2.50A.

Gremmelmaier, Claude, to Ciba-Geigy Corporation. Process for producing alkoxy ketones. 4,141,919, Cl. 260-594.000.

Grenat, Bernard: *See*—
Dubost, Rene; and Grenat, Bernard, 4,141,623, Cl. 350-96.230.

Greskovich, Charles D.; and Borom, Marcus P., to General Electric Company. Method for rapid removal of cores made of βAl_2O_3 from directionally solidified eutectic and superalloy and superalloy materials. 4,141,781, Cl. 156-637.000.

Grinage, Claude M., to Bullard Company, The. Tool changer for vertical boring machine. 4,141,133, Cl. 29-568.000.

Grohe, Klaus, to Hans Grohe KG. Pulsating water jet massage shower head construction. 4,141,502, Cl. 239-381.000.

Grosjean, Jean-Claude: *See*—
Denier, Guy; Vayssiere, Pierre; Giroud, Georges; and Grosjean, Jean-Claude, 4,141,723, Cl. 75-60.000.

Grosko, John A.: *See*—
Friend, Donald L.; Grosko, John A.; and Lanyi, Ernest S., 4,141,299, Cl. 105-260.000.

Grosse, Aristid V., to A. & T. Development Corporation. Solar still. 4,141,798, Cl. 202-234.000.

Grubba, Donald C., to Dresser Industries, Inc. Thermal spray powdered composite. 4,141,743, Cl. 106-66.000.

Grudzinskas, Charles V.; and Weiss, Martin J., to American Cyanamid Company. Novel 11-deoxy-11-substituted prostaglandins of the E and F series. 4,141,914, Cl. 260-464.000.

Grun, Gustav. Apparatus for the treatment of powdery or granular material. 4,141,316, Cl. 118-303.000.

GTE Automatic Electric Laboratories, Inc.: *See*—
Huntley, Christopher R., 4,142,162, Cl. 332-31.00T.

GTE Sylvania Incorporated: *See*—
Ingalls, Jeffrey D., 4,142,130, Cl. 315-188.000.
Koza, Francis R., 4,142,122, Cl. 313-220.000.

Gudell, Gary, to Jacoby-Bender, Inc. Hook and ring clasp. 4,141,118, Cl. 24-201.0HE.

Guild, John R., to Eastman Kodak Company. Development of light-sensitive quinone diazide compositions. 4,141,733, Cl. 96-49.000.

Gulf Oil Corporation: *See*—
Kirkpatrick, Joel L., 4,141,717, Cl. 71-90.000.

Gullick Dobson Limited: *See*—
Phillips, Reginald A.; Eckersley, John; and Hamilton, Terence, 4,141,594, Cl. 299-43.000.

Gulton Industries, Inc.: *See*—
Aikens, Wallace R., 4,142,227, Cl. 362-74.000.

Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, to Hoechst Aktiengesellschaft. 4-Benzoxazolyl-4'-oxadiazolyl stilbene optical brighteners. 4,142,044, Cl. 542-464.000.

Guritz, Elmer H., to Mostek Corporation. Integrated circuit with power supply voltage level detection. 4,142,118, Cl. 307-358.000.

H. C. Price Co.: *See*—
Hart, Milburn L.; and Bridge, John F., 4,141,130, Cl. 29-407.000.

Haas, David L., to Sperry Rand Corporation. Hair roller. 4,141,370, Cl. 132-39.000.

Haas, George A.; Shih, Arnold; and Thomas, Richard E., to United States of America, Navy. Method for determining conduction-band edge and electron affinity in semiconductors. 4,142,145, Cl. 324-62.000.

Habermann, Helmut; and Brunet, Maurice, to Societe Europeene de Propulsion. Electromagnetic bearings for mounting elongate rotating shafts. 4,141,604, Cl. 308-10.000.

Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, to Ciba-Geigy Corporation. Benz-acylbenzimidazole-2-carboxylic acid derivatives. 4,141,982, Cl. 424-267.000.

Hackenbroch, Wilhelm T.: *See*—
Diersing, Raymond A.; Hackenbroch, Wilhelm T.; Schweikle, George E.; and Stanback, Harris I., 4,142,225, Cl. 361-358.000.

Haes, Julius E., Jr.: *See*—
Weimert, Joseph F.; and Haes, Julius E., Jr., 4,141,173, Cl. 43-113.000.

Hagenbart, Donald E.: *See*—
Michel, Walter A.; and Hagenbart, Donald E., 4,141,492, Cl. 235-437.000.

Hakanson, Nils L.: *See*—
Lempke, George D.; and Hakanson, Nils L., 4,141,647, Cl. 355-10.000.

Hakko, James B., to Fansteel Inc. Tantalum metal powder. 4,141,719, Cl. 75-0.5BB.

Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,141,593, Cl. 299-34.000.

Halboth, Robert V. Inboard powered watercraft. 4,141,309, Cl. 115-70.000.

Hale, Harry O.; and Taylor, Joyce A. Method and means for producing motion in water beds. 4,141,096, Cl. 5-108.000.

Hale, Richard A., to International Harvester Company. Tractor chassis and cab suspension system. 4,141,429, Cl. 180-89.140.

Hallerback, Stig L., to AB Electrolux; and SKF Industrial Trading and Development Company. Commutator motor. 4,142,120, Cl. 310-59.000.

Halley, David G.: *See*—
Arnold, Eugene W.; Brock, Gregory K.; and Halley, David G., 4,141,390, Cl. 141-9.000.

Halliburton Company: *See*—
Watson, Jimmie L., 4,141,843, Cl. 252-8.55R.

Hallmark Cards, Incorporated: *See*—
Reed, David F., 4,141,663, Cl. 401-68.000.

Halsey, Arthur E., to Vacuumatic Limited. Conveyor system for delivering articles in succession. 4,141,443, Cl. 198-471.000.

Hamada, Makoto; Miura, Shuji; and Watanabe, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Support assembly for radiators and air conditioning condensors. 4,141,426, Cl. 180-68.00R.

Hamagishi, Yasutaro: *See*—
Nishino, Toyokazu; Hamagishi, Yasutaro; Oki, Toshikazu; and Murao, Sawao, 4,141,972, Cl. 424-180.000.

Hamano, Masaaki: *See*—
Yajima, Seishi; and Hamano, Masaaki, 4,141,726, Cl. 75-229.000.

Hamermesh, Charles L.: *See*—
Lo, George A.; and Hamermesh, Charles L., 4,141,768, Cl. 149-19.300.

Hamill, Robert L.: *See*—
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,141,907, Cl. 260-345.70R.

Hamilton, C. Howard; and Ascani, Leonard A., to Rockwell International Corporation. Method of making a metallic structure by combined flow forming and bonding. 4,141,484, Cl. 228-265.000.

Hamilton, Terence: *See*—
Phillips, Reginald A.; Eckersley, John; and Hamilton, Terence, 4,141,594, Cl. 299-43.000.

Hamlin, James S., to Du Pont de Nemours, E. I., and Company. Web processor. 4,142,194, Cl. 354-318.000.

Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, to Hoechst Aktiengesellschaft. Shaped article of cellulose hydrate with a coating of plastic material of chemically modified protein and process for the production thereof. 4,142,013, Cl. 428-36.000.

Hammond Corporation: *See*—
Schrecongost, Ray B., 4,141,270, Cl. 84-1.240.

Hammond, Howard A.; and Sardina, John F., to Eaton Corporation. Safety latch for tractor loader. 4,141,257, Cl. 74-529.000.

Hanan, Abraham. Earring display rack. 4,141,453, Cl. 211-163.000.

Handa, Takayuki: *See*—
Nagai, Kiyoshi; Ikeda, Hitoshi; and Handa, Takayuki, 4,141,641, Cl. 355-1.000.

Hannan, William J., to RCA Corporation. Color image storage and display utilizing holography. 4,142,204, Cl. 358-2.000.

Hans Grohe KG.: *See*—
Grohe, Klaus, 4,141,502, Cl. 239-381.000.

Hansen, David R., to Shell Oil Company. Adhesive composition containing a polyphenylene ether resin. 4,141,876, Cl. 260-33.6UA.

Hansen, Wilbur O., to General Electric Company. Failed diode indicator. 4,142,151, Cl. 324-158.00D.

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Henderson, Francis A.; and Wolfe, Roger M., 4,141,455, Cl. 212-55.000.

Harrington, Colin J.: *See*—
Askew, Herbert F.; Harrington, Colin J.; and Jayne, Gerald J. J., 4,141,851, Cl. 252-78.300.

Harsco Corporation: *See*—
Fischer, John J., 4,141,657, Cl. 366-232.000.

Hart, Lewis F., to RCA Corporation. Apparatus and method for aligning wafers. 4,141,456, Cl. 214-1.00R.

Hart, Milburn L.; and Bridge, John F., to H. C. Price Co. Method and apparatus for centering two concentric cylinders. 4,141,130, Cl. 29-407.000.

Hart, Radford H. Water vapor injection system. 4,141,323, Cl. 123-25.00B.

Harte, Kenneth J., to Control Data Corporation. Method and means for dynamic correction of electrostatic deflector for electron beam tube. 4,142,132, Cl. 315-370.000.

Harvey, Norman L. Student's computer. 4,142,232, Cl. 364-200.000.

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Aoki, Yutaka; Hase, Akira; Ito, Jiro; and Nagai, Hisomu, 4,141,793, Cl. 201-6.000.

Hase, Alfred M. Ferroresonant voltage regulating circuit. 4,142,141, Cl. 323-6.000.

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Ishikawa, Kenkichi; Kumagai, Shinobu; Hasegawa, Teruyuki; and Sakamoto, Akiyoshi, 4,141,249, Cl. 73-423.00R.

Hasegawa, Tetsuo; Touma, Hitoshi; Satomi, Kunio; and Miyamae, Tatsuo, to Canon Kabushiki Kaisha. Developer for developing electrostatic latent images. 4,141,849, Cl. 252-62.10P.

Hasler, Werner; and Padmanabhan, Subramaniam, to International Business Machines Corporation. Print hammer for type printers. 4,141,290, Cl. 101-93.480.

Hassler, Hedvig E. B.: *See*—
Kihlstedt, Per G.; and Hassler, Hedvig E. B., 4,141,698, Cl. 55-6.000.

Hata, Yoshio; and Harada, Hiroyuki, to Copal Company Limited. Mechanism for actuating a platen in a printer. 4,141,291, Cl. 101-99.000.

Hatchell, David C.: *See*—
Ferguson, Andrew M.; Keith, Ernest V.; and Hatchell, David C., 4,141,094, Cl. 5-81.00R.

Hatfield, Hubert P. Portable egg transporting unit. 4,141,320, Cl. 119-37.000.

Hatz, Ernst; and Absenger, Erich, to Motorenfabrik Hatz GmbH & Co. KG. Sound-proofed internal combustion engine. 4,141,334, Cl. 123-198.00E.

Hatz, Ernst, to Motorenfabrik Hatz GmbH & Co. KG. Vehicle, in particular tractor. 4,141,422, Cl. 180-1.00F.

Hatzakis, Michael; Lapadula, Constantino; and Lin, Burn J., to International Business Machines Corporation. Resist development control system. 4,142,107, Cl. 250-571.000.

Hauri, Jacques: *See*—
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,142,068, Cl. 179-15.0AT.

Hauser, Victor E., Jr.; and Sinha, Ashok K., to Bell Telephone Laboratories, Incorporated. Method of coating semiconductor substrates. 4,142,004, Cl. 427-39.000.

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Thies, Peter W.; David, Samuel; Hauth, Hartmut; and Roemer, Dietmar, 4,141,988, Cl. 424-278.000.

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Usui, Keizaburo; and Hayakawa, Yoshikazu, 4,141,240, Cl. 73-114.000.

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Hayden, Mark W.: *See*—
Taylor, David C.; and Hayden, Mark W., 4,142,138, Cl. 318-542.000.

Hayes, Thomas J.; and Reed, William M. Tennis racket. 4,141,549, Cl. 273-29.00A.

Hazelrigg, Mark J., Jr.: *See*—
Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., 4,142,005, Cl. 427-126.000.

Heckmann, Wolfgang; and Reulecke, Wilhelm, to Klockner-Humboldt Deutz AG. Oscillating centrifuge for the dehydration of fine grained material. 4,141,837, Cl. 210-365.000.

Hedlund, Lee V.; Fink, Ronald P.; and Wright, David L, to RCA Corporation. Disc track servo system. 4,142,209, Cl. 358-128.00.

Heeres, Jan, to Janssen Pharmaceutica N.V. 2-Aryl-1,3-dioxolanes. 4,141,908, Cl. 260-340.90R.

Hefele, Josef, to Kufner Textilwerke KG. Apparatus for the patterned deposition of powdered thermoplastics adhesive material on the outer surface of a surface form. 4,141,313, Cl. 118-212.000.

Hegar, Gert; and Back, Gerhard, to Ciba-Geigy Corporation. Azo compounds having a 3-sulphomethyl-pyrazolone-(5) coupler component. 4,141,890, Cl. 260-153.000.

Hellquist, Ivan A.: *See*—
Dahlback, Gunnar; and Hellquist, Ivan A., 4,141,353, Cl. 128-142.00R.

Hemphill, Kent W., to Xerox Corporation. Transfer of dry developed electrostatic image using plural oppositely charged fields. 4,141,728, Cl. 96-1.400.

Henderson, Francis A.; and Wolfe, Roger M., to Harnischfeger Corporation. Means for storing and connecting jib on telescopic crane boom. 4,141,455, Cl. 212-55.000.

Henderson, Ralph W.: *See*—
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Hendriksen, Henrik V. Nozzle for drawing off welding fumes. 4,141,285, Cl. 98-115.00R.

Hengesbach, Robert W. Controlled irrigation device. 4,141,477, Cl. 222-569.000.

Henke, Donald L., to VEDA, Inc. Machine and method for stacking hay. 4,141,288, Cl. 100-35.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Osberghaus, Rainer; and Blum, Helmut, 4,141,967, Cl. 424-47.000.

Henry, Donald E. Process for stripping physiological matrices from cells. 4,141,964, Cl. 424-3.000.

Henry, Raymond; and Bouvet, Jean-Victor, to Thomson-CSF. Semiconductor process using lapped substrate and lapped low resistivity semiconductor carrier. 4,141,135, Cl. 29-580.000.

Henry, Raymond; and Morel, Philippe, to Thomson-CSF. Method of fabricating semiconductor devices with a low thermal resistance and devices obtained by the method. 4,141,136, Cl. 29-590.000.

Hepper, Peter; and Steiner, Willy, to Elmes Staub & Co., AG. Recording ribbon mechanism for instrument recorders. 4,141,662, Cl. 400-194.000.

Herb, Armin; and Uhlig, Raimer, to Hilti Aktiengesellschaft. Sound dampening fastening element. 4,141,528, Cl. 248-560.000.

Herbst, Noel M.; Liu, Chao N.; and Panissidi, Hugo A., to International Business Machines Corporation. Pressure sensing device and transducer arrangement. 4,142,175, Cl. 340-146.3SY.

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Cassidy, Patrick J.; Goepelman, Robert T.; Stapley, Edward O.; and Hernandez, Sebastian, 4,141,986, Cl. 424-274.000.

Herrmann, Gunther, to Kolimorgen Technologies Corporation. Process and apparatus for controlling metal thickness, and deposition and degradation rates. 4,142,099, Cl. 250-308.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 1-Halomethyl-6-phenyl-4H-s-[4,3-a][1,4]benzodiazepines. 4,141,902, Cl. 260-308.00R.

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Hewlett-Packard Company: *See*—
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O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,141,860, Cl. 252-455.00Z.

Hill, David W.; Katz, Lewis E.; Lavigna, Robert J.; and Reusser, Raymond E., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Method and apparatus for avoiding undesirable deposits in crystal growing operations. 4,141,779, Cl. 156-617.0SP.

Hill, Douglas W.: *See*—
Raden, Daniel S.; Weiner, Morton A.; and Hill, Douglas W., 4,141,862, Cl. 521-129.000.

Hill, James E.: *See*—
Brandt, Robert W.; Fisher, Robert D.; and Hill, James E., 4,142,238, Cl. 364-552.000.

Hillberg, Robert L., to Browning Arms Company. Magazine isolator for pump shotguns. 4,141,164, Cl. 42-17.000.

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Hindemit, Arno R. Soft carrying case. 4,141,401, Cl. 150-52.00R.

Hinojosa, Octavio G.: *See*—
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Hirai, Kentato; Fujishita, Toshio; Ishiba, Teruyuki; and Sugimoto, Hiroshiko, to Shionogi & Co., Ltd. Process for producing triazolylbenzophenone derivatives. 4,141,901, Cl. 260-308.00R.

Hiraoka, Michio: *See*—
Okamura, Hiromichi; Kato, Iwao; Hiraoka, Michio; and Torium, Kinuko, 4,142,020, Cl. 428-403.000.

Hirata, Hisashi, to Kabushiki Kaisha Maruki Shokai. Stencil hand stamp with sliding cover. 4,141,292, Cl. 101-125.000.

Hirohata, Hyogo: *See*—
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Hirota, Ryoichi: *See*—
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Hirsch, Robert L., to United States of America, Energy. Method of mounting a fuel pellet in a laser-excited fusion reactor. 4,142,088, Cl. 219-121.00L.

Hirschkoff, Sidney; and Milliken, Douglas A., to McCulloch Corporation. Chain saw handle and vibration isolation system. 4,141,143, Cl. 30-381.000.

Hiscock, Benjamin E.; and Reich, Zygmund, to Simmonds Precision Products, Inc. Reduced power incandescent bar type display device. 4,141,161, Cl. 40-547.000.

Hise, Ronald D.: *See*—
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Tsukada, Toshihisa; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,142,160, Cl. 331-94.50H.

Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha: *See*—
Kato, Akira; Matsuda, Shinpei; Uno, Shigeo; Sakuta, Youichi; Nakajima, Fumito; and Kagabu, Hiroshi, 4,141,959, Cl. 423-239.000.

Hittman Corporation: *See*—
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Kuwabara, Katsutoshi; and Ishii, Kanji, 4,142,219, Cl. 361-18.000.
Nakayama, Hiroshi, 4,142,187, Cl. 340-554.000.
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Hodgson, Norman D.: *See*—
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Hodne, Ingard B.: *See*—
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Hoechst Aktiengesellschaft: *See*—
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,142,044, Cl. 542-464.000.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,142,013, Cl. 428-36.000.
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Hoffman, James K. Golf ball storing, dispensing and teeing apparatus. 4,141,558, Cl. 273-201.000.

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Hogan, James M.; and White, John R., to Goodyear Tire & Rubber Company, The. Method of stabilizing a mixture of low and high molecular weight polyethers. 4,141,852, Cl. 252-182.000.

Hoisington, Paul A.: *See*—
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Holcomb, Stephen A. Cycle seat with back support. 4,141,587, Cl. 297-195.000.

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Hollingsworth, Guilford L.; and Charters, Alexander C., to United States of America, Navy. Afterburner recoilless rifle. 4,141,275, Cl. 89-1.703.

Holm, LeRoy W., to Union Oil Company of California. Enhanced oil recovery using alkaline sodium silicate solutions. 4,141,416, Cl. 166-270.000.

Holtvoigt, John H., to Dolly Toy Company, The. Globe lamp with circumnavigating aircraft. 4,141,156, Cl. 35-46.00A.

Holzemer, John F.: *See*—
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Honeywell Information Systems Inc.: *See*—
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Honsberg, Wolfgang: *See*—
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Hooker Chemicals & Plastics Corp.: *See*—
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Hoos, Paul R., to Norris Industries, Inc. Dead bolt guard. 4,141,234, Cl. 70-350.000.

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Hoss, Georg; and de Jong, Eduard, to Plate Bonn Gesellschaft mit beschrankter Haftung. Heat-sealing thermoplastic adhesive. 4,141,869, Cl. 260-29.15B.

Houska, Jaroslav, to BBC Brown, Boveri & Company, Limited. Method of manufacturing plastic-bonded (LnCo) magnets. 4,141,943, Cl. 264-24.000.

Hsiao, Mu Y.: *See*—
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Beny, Janos; Moore, James D.; and Ryan, John W., 4,141,553, Cl. 273-86.00B.
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Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polycondensates containing hydroxyquinoline end groups, their use for the preparation of polymers containing metals and metal containing polycondensates. 4,142,035, Cl. 528-177.000.

Idemitsu Kosan Co., Ltd.: *See*—
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Iinuma, Kazumoto, to Nippon Electric Co., Ltd. Interframe CODEC for composite color TV signals comprising means for inverting the polarity of carrier chrominance signals in every other frame or line. 4,142,205, Cl. 358-13.000.

Ikeda, Hitoshi: *See*—
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Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
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Institutet for Vatten- och Luftvardsforskning: *See—*
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Bean, Bradford M.; Langston, Keith N.; Partridge, Richard L.; and Sy, Kian-Bon K., 4,142,234, Cl. 364-200.000.
Chen, Chin L.; and Hsiao, Mu Y., 4,142,174, Cl. 340-146.1AL.
Croisier, Alain; Esteban, Daniel; and Galand, Claude, 4,142,071, Cl. 179-15.55R.
Duvochel, Henri P.; Kuhne, Roland E.; and Laurent, Bernard P., 4,142,242, Cl. 364-759.000.
Gaitten, Ronald E.; and Smith, Gerald L., 4,141,648, Cl. 355-14.000.
Hasler, Werner; and Padmanabhan, Subramaniam, 4,141,290, Cl. 101-93.480.
Hatzakis, Michael; Lapadula, Constantino; and Lin, Burn J., 4,142,107, Cl. 250-571.000.
Herbst, Noel M.; Liu, Chao N.; and Panissidi, Hugo A., 4,142,175, Cl. 340-146.3SY.
Keefe, George E.; and Lin, Yeong S., 4,142,250, Cl. 365-36.000.
Pipkin, David J.; and Schaefer, Donald W., 4,142,010, Cl. 427-355.000.
Queener, Carl A., 4,141,546, Cl. 271-173.000.
Simi, Victor M.; and Soderman, Donald A., 4,142,199, Cl. 357-24.000.
Toth, Ronald L., 4,142,106, Cl. 250-559.000.
International Harvester Company: *See—*
Hale, Richard A., 4,141,429, Cl. 180-89.140.
Swanson, William C.; and Galos, Imre, 4,141,283, Cl. 91-461.000.
International Paper Company: *See—*
Eckert, Robert C., 4,141,786, Cl. 162-40.000.
Gordon, Robert L.; Naugle, George H.; and Cooper, Keith A., 4,141,466, Cl. 220-462.000.
International Standard Electric Corporation: *See—*
Ellwood, George; and Dalgoutte, David G., 4,141,776, Cl. 156-502.000.
International Tapetronics Corp.: *See—*
Jenkins, John P.; and Fesler, John, 4,142,221, Cl. 361-151.000.
International Telephone & Telegraph Corp.: *See—*
Ward, Charles R.; and Reilly, Robert A., 4,142,240, Cl. 364-717.000.
Internationale Octooimaatschappij "Octropa" B.V.: *See—*
Aneja, Rajindra; Davies, Alan P.; and Keith, Maxwell C., 4,141,994, Cl. 424-331.000.
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Chidlow, John W.; and Porter, Philip, 4,141,970, Cl. 424-92.000.
Iowa Beef Processors, Inc.: *See—*
Olson, Stephen R., 4,141,516, Cl. 242-55.530.
Iowa State Univ. Research Foundation, Inc.: *See—*
Buchele, Wesley F.; Baldwin, William I.; Eidet, James H.; and Marley, Steven J., 4,141,419, Cl. 172-1.000.
IRECO Chemicals: *See—*
Sudweeks, Walter B.; and Jessop, Harvey A., 4,141,767, Cl. 149-2.000.
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., to Eastman Kodak Company. Heterocyclic ester ultraviolet stabilizers and their use in organic compositions. 4,141,884, Cl. 260-45.80N.
Ishiba, Teruyuki: *See—*
Hirai, Kentato; Fujishita, Toshio; Ishiba, Teruyuki; and Sugimoto, Hiroshiko, 4,141,901, Cl. 260-308.00R.
Ishihara, Masamitsu. Hydraulic bending machine. 4,141,235, Cl. 72-213.000.
Ishii, Kanji: *See—*
Kuwabara, Katsutoshi; and Ishii, Kanji, 4,142,219, Cl. 361-18.000.
Ishikawa, Kenkichi; Kumagai, Shinobu; Hasegawa, Teruyuki; and Sakamoto, Akiyoshi, to Nippon Kokan Kabushiki Kaisha. Sub-lance assembly for sampling and temperature-measuring of molten metal during refining. 4,141,249, Cl. 73-423.00R.
Ishikawa, Koji: *See—*
Ozawa, Hiroshi; Torii, Yoshinori; Kobayashi, Nobuki; and Ishikawa, Koji, 4,142,018, Cl. 428-323.000.
Ishikawa, Masao: *See—*
Kumagai, Kimio; and Ishikawa, Masao, 4,142,228, Cl. 362-233.000.
Ishikawa, Youhei: *See—*
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Goga, Atsushi; Ikui, Takefumi; Obi, Mikio; and Kameda, Shinya, 4,141,534, Cl. 251-58.000.
Hara, Tsutomu; and Masuda, Bunpei, 4,141,266, Cl. 83-337.000.
Ishitani, Akira: *See—*
Kato, Tetsuya; Ishitani, Akira; and Kobori, Kiyotomi, 4,142,031, Cl. 526-4.000.
Ismach, Aaron. Ventilator system for controlling, assisting and monitoring a patient's breathing. 4,141,354, Cl. 128-145.600.
Isner, Andrew B.: *See—*
Lofkrantz, John E. E.; and Isner, Andrew B., 4,141,784, Cl. 162-17.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See—*
Szabolcs, Otto; and Schuller, Hans, 4,141,957, Cl. 422-135.000.
Israel, Henry M., to Raytheon Company. High frequency power supply microwave oven. 4,142,082, Cl. 219-10.55B.
Itakura, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,141,269, Cl. 84-1.220.
Ito, Jiro: *See—*
Aoki, Yutaka; Hase, Akira; Ito, Jiro; and Nagai, Hisomu, 4,141,793, Cl. 201-6.000.
Ito, Ryoichi: *See—*
Tsukada, Toshihisa; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,142,160, Cl. 331-94.50H.
Ivan, Joseph R. Collapsible wind deflector. 4,141,580, Cl. 296-1.00S.
Ivanov, Boris E.: *See—*
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.
J. I. Case Company: *See—*
Maurer, Herman J., 4,141,282, Cl. 91-374.000.
Jabarin, Saleh A.; and Lewis, Elizabeth A., to Owens-Illinois, Inc. Processing polyesters to minimize acetaldehyde formation. 4,142,040, Cl. 528-502.000.
Jackson, Allen F. Fog free ski mask. 4,141,086, Cl. 2-436.000.
Jacobsen, Stephen C.; Stephen, Robert L.; Johnson, R. Todd; Luntz, Richard; and Knutti, David, to University of Utah. Epidermal iontophoresis device. 4,141,359, Cl. 128-172.100.
Jacobson, Peter E.; and Allen, Terry S., to Sperry Rand Corporation. Tool for assembling electrical contact assembly. 4,141,139, Cl. 29-755.000.
Jacoby-Bender, Inc.: *See—*
Gudell, Gary, 4,141,118, Cl. 24-201.0HE.
James, Gordon W.; and Storm, David G., to Motorola, Inc. ECG electrode impedance checking system as for emergency medical service. 4,141,351, Cl. 128-2.06R.
James, Jesse L.; and Spector, George. Interlocking suture. 4,141,363, Cl. 128-335.000.
Jamiolkowski, Dennis D.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,141,087, Cl. 3-1.000.
Janka, John C.: *See—*
Schora, Frank C.; and Janka, John C., 4,141,417, Cl. 166-305.00R.
Jannen, Robert L.; and Johnston, Douglas, to John Blue Company Division of Subscription Television, Inc. Pump for soil fumigant. 4,141,676, Cl. 417-539.000.
Janome Sewing Machine Co. Ltd.: *See—*
Takenoya, Hideaki; and Makabe, Hachiro, 4,141,305, Cl. 112-158.00E.
Jansky, Norbert E. Drill leveling arrangement. 4,141,151, Cl. 33-334.000.
Janssen Pharmaceutica N.V.: *See—*
Heeres, Jan, 4,141,908, Cl. 260-340.90R.
Japan Radio Company, Ltd.: *See—*
Nagai, Kiyoshi; Ikeda, Hitoshi; and Handa, Takayuki, 4,141,641, Cl. 355-1.000.
Nagai, Kiyoshi; Ohashi, Hiroshi; and Ohiwa, Takao, 4,141,642, Cl. 355-1.000.
Jarsen, Manfred H., to MCA Disco-Vision, Inc. Method of creating a replicating matrix. 4,141,731, Cl. 96-35.100.
Jay, Ronald F.: *See—*
Forrest, Gordon C.; Jay, Ronald F.; and Clements, John A., 4,141,687, Cl. 23-230.00R.
Jayne, Gerald J. J.; and Askew, Herbert F., to Edwin Cooper and Company Limited. Lubricant additive. 4,141,846, Cl. 252-48.200.
Jayne, Gerald J. J.: *See—*
Askew, Herbert F.; Harrington, Colin J.; and Jayne, Gerald J. J., 4,141,851, Cl. 252-78.300.

Jelmorini, Gerardus: *See—*
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., 4,142,090, Cl. 219-121.00P.
Jenkins, John P.; and Fesler, John, to International Tapetronics Corp. NAB tape cartridge eraser and splice finder. 4,142,221, Cl. 361-151.000.
Jensen, Robert H.: *See—*
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., 4,141,690, Cl. 422-216.000.
Jessop, Harvey A.: *See—*
Sudweeks, Walter B.; and Jessop, Harvey A., 4,141,767, Cl. 149-2.000.
Jex, Edward R. Extrusion machinery with speed control. 4,141,678, Cl. 425-145.000.
Joa, Curt G. Horizontal diaper grouper. 4,141,193, Cl. 53-529.000.
Johann Wolf Gesellschaft m.b.H. KG.: *See—*
Wolf, Johann, 4,141,321, Cl. 119-51.00R.
Johansson, Fritz A., to Bourns, Inc. Remote transducer monitoring system. 4,142,148, Cl. 324-140.00R.
Johansson, Nils L., to AB Calator. Apparatus and method for buttoning garments. 4,141,131, Cl. 29-428.000.
Johansson, Sven H. Device for supporting, raising and lowering duct in deep bore hole. 4,141,414, Cl. 166-212.000.
John Blue Company Division of Subscription Television, Inc.: *See—*
Jannen, Robert L.; and Johnston, Douglas, 4,141,676, Cl. 417-539.000.
John, Julius F., to Norco Industries, Inc. Interlocking jack stand. 4,141,526, Cl. 248-352.000.
John O. Butler Company: *See—*
Tarrson, Emanuel B.; and Tisma, Stevan, 4,141,519, Cl. 242-137.100.
Johns Hopkins University, The: *See—*
Fischell, Robert E.; and Powell, William R., 4,141,365, Cl. 128-404.000.
Johnson Farm Machinery Co., Inc.: *See—*
Johnson, Howard B., 4,141,200, Cl. 56-10.200.
Johnson, Howard B., to Johnson Farm Machinery Co., Inc. Automatic header adjustment for harvesters. 4,141,200, Cl. 56-10.200.
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Jacobsen, Stephen C.; Stephen, Robert L.; Johnson, R. Todd; Luntz, Richard; and Knutti, David, 4,141,359, Cl. 128-172.100.
Johnson, Russell W.: *See—*
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,141,860, Cl. 252-455.00Z.
Johnston, Douglas: *See—*
Jannen, Robert L.; and Johnston, Douglas, 4,141,676, Cl. 417-539.000.
Jones, Ian R. Dual-flush, tank-actuating device. 4,141,092, Cl. 4-324.000.
Jordan, Thomas F.: *See—*
Mascia, Carmen T.; and Jordan, Thomas F., 4,141,448, Cl. 206-485.000.
Josef, Michael J.: *See—*
Romanski, Eric R.; and Josef, Michael J., 4,141,388, Cl. 139-383.00A.
Joshi, David P.: *See—*
Fischer, Charles F.; and Joshi, David P., 4,141,947, Cl. 264-75.000.
Jowitt, Peter F.: *See—*
Stanistreet, Harold P.; and Jowitt, Peter F., 4,141,460, Cl. 220-88.00A.
Jowitt, Peter Frederick: *See—*
Stanistreet, Harold P.; and Jowitt, Peter F., 4,141,460, Cl. 220-88.00A.
Joye, Jacques: *See—*
Kepes, Andre; and Joye, Jacques, 4,141,953, Cl. 264-340.000.
Jukes, John A.; and McGettigan, Philip A., to Northern Telecom Limited. Polymer coated heat insulated electrical conductor comprising a layer of electrically insulating, heat resistant fibrous material. 4,142,019, Cl. 428-380.000.
Justus, Edgar J., to Beloit Corporation. Method of and means for forming multi-ply paper webs from a single headbox. 4,141,788, Cl. 162-125.000.
Justus, Edgar J., to Beloit Corporation. Headbox having pivoted bridging cover. 4,141,789, Cl. 162-272.000.
Kabushiki Kaisha Daikin Seisakusho: *See—*
Fukatani, Yasunobu, 4,141,441, Cl. 192-70.250.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Kugisawa, Toshio, 4,141,268, Cl. 84-1.030.
Kabushiki Kaisha Maruki Shokai: *See—*
Hirata, Hisashi, 4,141,292, Cl. 101-125.000.
Kada, Isamu: *See—*
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Kagabu, Hiroshi: *See—*
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Kahl, John S.: *See—*
Fernandez, Ramon J.; and Kahl, John S., 4,141,377, Cl. 137-236.000.
Kai, Fumio: *See—*
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.
Kaiser Aluminum & Chemical Corporation: *See—*
DeGraff, Clifford A., 4,141,666, Cl. 405-126.000.
Kaiser, Bernd-Ulrich: *See—*
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Kali-Chemie Pharma GmbH: *See—*
Thies, Peter W.; David, Samuel; Hauth, Hartmut; and Roemer, Dietmar, 4,141,988, Cl. 424-278.000.
Kalnin, Igor M.; Krotkov, Vladimir N.; Sutyrina, Taisia M.; Sergeeva, Anna N.; and Sergeev, Oleg A. Tubular heat exchanger. 4,141,411, Cl. 165-151.000.
Kalron, Avraham: *See—*
Freilich, Arthur; and Kalron, Avraham, 4,142,241, Cl. 364-724.000.
Kalvaitis, Arvydas J., to S & C Electric Co. Compact mounting assembly for electrical switching elements. 4,142,078, Cl. 200-48.00R.
Kameda, Shinya: *See—*
Goga, Atsushi; Ikui, Takefumi; Obi, Mikio; and Kameda, Shinya, 4,141,534, Cl. 251-58.000.
Kameda, Tohru: *See—*
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Kamosaki, Minoru: *See—*
Ando, Ken; Kamosaki, Minoru; Ohya, Yoshinobu; and Asai, Sigeru, 4,141,774, Cl. 156-309.000.
Kanai, Tadashi; Maruyama, Osamu; and Aoki, Akiji, to Kohjin Co., Ltd. Novel N^4-Acyloxy-2,2'-cyclocytidines and process for preparation thereof. 4,142,041, Cl. 536-23.000.
Kanbe, Hiroshi: *See—*
Mizushima, Yoshihiko; Kajiyama, Kenji; Kimura, Tatsuya; and Kanbe, Hiroshi, 4,142,200, Cl. 357-30.000.
Kane, James: *See—*
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Kao Soap Co., Ltd.: *See—*
Matsunaga, Kinjiro; Sone, Yukiko; and Nakagawa, Yunosuke, 4,141,748, Cl. 106-212.000.
Kappler, Ulrich; and Sundermann, Rudolf, to Bayer Aktiengesellschaft. Production of tris-(2-hydroxyaryl) esters of cyanuric acid. 4,142,048, Cl. 544-219.000.
Karaba, Albert M., to United States of America, America. Low emission internal combustion engine. 4,141,324, Cl. 123-32.00R.
Karl Mayer Textilmaschinen Fabrik GmbH: *See—*
Kohl, Karl. 4,141,230, Cl. 66-204.000.
Karmazin Products Corporation: *See—*
Woodhull, Ivan D., Jr.; and Liedel, Thomas H., 4,141,409, Cl. 165-110.000.
Karrer, Friedrich, to Ciba-Geigy Corporation. Phenoxyphenyl- and phenoxybenzyl-alkynyl ethers. 4,141,921, Cl. 568-636.000.
Kartanson, John M.; and Neel, Robert M., to RJR Archer, Inc. Method for deoiling metal scrap. 4,141,373, Cl. 134-21.000.
Karubian, Ralph. Carcass splitting band-saw. 4,141,142, Cl. 30-380.000.
Kasamura, Toshirou: *See—*
Sato, Tadashi; Torigai, Akiyoshi; Kasamura, Toshirou; and Tanaka, Hidetoshi, 4,141,644, Cl. 355-3.0CH.
Kaslow, Richard. Board game apparatus. 4,141,560, Cl. 273-244.000.
Katata, Toshinobu: *See—*
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Katchka, Jay R.; and Kelly, Samuel T., to Robertshaw Controls Company. Solenoid and method of manufacture. 4,142,169, Cl. 335-243.000.
Kato, Akira; Matsuda, Shinpei; Uno, Shigeo; Sakuta, Youichi; Nakajima, Fumito; and Kagabu, Hiroshi, to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha. Process for removing nitrogen oxides from combustion flue gas. 4,141,959, Cl. 423-239.000.
Kato, Iwao: *See—*
Okamura, Hiromichi; Kato, Iwao; Hiraoka, Michio; and Torium, Kinuko, 4,142,020, Cl. 428-403.000.
Kato, Kazuyoshi. Toggle clamp device. 4,141,543, Cl. 269-228.000.
Kato, Tetsuya; Ishitani, Akira; and Kobori, Kiyotomi, to Toray Industries, Inc. Polycaprolactam composition having improved melt spinnability and method for improving melt spinnability of polycaprolactam. 4,142,031, Cl. 526-4.000.
Katz, Lewis E.: *See—*
Hill, David W.; Katz, Lewis E.; Lavigna, Robert J.; and Reusser, Raymond E., 4,141,779, Cl. 156-617.0SP.
Kauffman, Ivan L.; and Kellogg, Robert C., to Monsanto Company. Rotary stretch blow molding apparatus. 4,141,680, Cl. 425-529.000.
Kaverin, Boris S.: *See—*
Domrachev, Georgy A.; Khamylov, Vyacheslav K.; Bochkarev, Mikhail N.; Zhuk, Boris V.; Kaverin, Boris S.; Nesterov, Boris A.; and Kirillov, Alexandr I., 4,141,778, Cl. 156-613.000.
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Kawawa, Takao; Imai, Ryoichiro; Tokunaga, Hisami; Nakano, Yutaka; and Sasaki, Naoaki, to Nippon Kokan Kabushiki Kaisha; and Osaka Oxygen Industries, Ltd. Oxygen sensors. 4,141,812, Cl. 204-195.00S.
Kawneer Company, Inc.: *See—*
Sukolics, Ronald D., 4,141,188, Cl. 52-395.000.
Kayaba Industry Co., Ltd.: *See—*
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Kayex Corporation: *See—*
Gill, Gerald L., Jr.; and Rioux, Philip J., 4,141,180, Cl. 51-5.00R.

Keefe, George E.; and Lin, Yeong S., to International Business Machines Corporation. Bubble translation switch using magnetic charged wall. 4,142,250, Cl. 365-36.000.

Keeler Corporation: *See*—
Little, Carl H.; and Deshaw, W. Rex, 4,142,167, Cl. 335-190.000.

Keggenhoff, Berthold; Rosenkranz, Hans J.; and Rudolph, Hans, to Bayer Aktiengesellschaft. Bulk photo polymerization process for esters of acrylic and methacrylic acids. 4,141,806, Cl. 204-159.220.

Keillor, Benjamin O., to Chisholm-Ryder Company, Inc. Fruit harvester. 4,141,203, Cl. 56-328.00R.

Keiper Automobiltechnik GmbH & Co. KG.: *See*—
Kluting, Bernd; and Voss, Hans W., 4,141,583, Cl. 296-65.00R.

Keiper Trainingsysteme GmbH & Co.: *See*—
Bargenda, Siegfried, 4,141,248, Cl. 73-379.000.

Keith, Elvin W. Solar collector cover. 4,141,185, Cl. 52-171.000.

Keith, Ernest V.: *See*—
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Keith, Maxwell C.: *See*—
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Keller, Helmut: *See*—
Bommersheim, Hans; Hettich, Bernhard; Keller, Helmut; Moser, Werner; and Tauchert, Klaus, 4,141,660, Cl. 400-124.000.

Keller, James L., to Union Oil Company of California. Tagged fuel compositions. 4,141,692, Cl. 44-59.000.

Kelley, John S.; and Newton, Albert E., to USM Corporation. Closure and method for easy opening of cans. 4,141,464, Cl. 220-267.000.

Kellogg, Robert C.: *See*—
Kauffman, Ivan L.; and Kellogg, Robert C., 4,141,680, Cl. 425-529.000.

Kelly, Ralph: *See*—
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,141,966, Cl. 424-45.000.

Kelly, Richard L. Guard and locking combination therewith. 4,141,232, Cl. 70-54.000.

Kelly, Samuel T.: *See*—
Katchka, Jay R.; and Kelly, Samuel T., 4,142,169, Cl. 335-243.000.

KeNova AB: *See*—
Nilson, Billy N., 4,141,475, Cl. 222-494.000.
Nilson, Nils B., 4,141,474, Cl. 222-493.000.

Kepes, Andre; and Joye, Jacques, to Societe Chimique des Charbonnages CdF Chimie. Method for accelerating the transformation of the crystalline form of isotactic polybutene pipe. 4,141,953, Cl. 264-340.000.

Kerr, John L., to United States of America, Army. Microstrip feed with reduced aperture blockage. 4,142,190, Cl. 343-700.0MS.

Kerres, Hans: *See*—
Thiel, Reinhard; Dietz, Karl-Heinz; Kerres, Hans; Rosenbaum, Heinz J.; and Steiner, Siegfried, 4,141,829, Cl. 210-63.00R.

Keskitalo, Tage O.: *See*—
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Kesseler, Helmut: *See*—
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Keuchel, Herbert W., to PNC Company. Process and apparatus for manufacturing a non-woven fabric and the product thereof. 4,141,773, Cl. 156-244.150.

Khamylov, Vyacheslav K.: *See*—
Domrachev, Georgy A.; Khamylov, Vyacheslav K.; Bochkarev, Mikhail N.; Zhuk, Boris V.; Kaverin, Boris S.; Nesterov, Boris A.; and Kirillov, Alexandr I., 4,141,778, Cl. 156-613.000.

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Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

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Kief, Heinrich: *See*—
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Kienzle Apparate GmbH: *See*—
Bommersheim, Hans; Hettich, Bernhard; Keller, Helmut; Moser, Werner; and Tauchert, Klaus, 4,141,660, Cl. 400-124.000.

Kihlstedt, Per G.; and Hassler, Hedvig E. B., to Advanced Mineral Research AB. Method of cleaning particle bearing gas. 4,141,698, Cl. 55-6.000.

Kikyotani, Sho: *See*—
Matsuda, Hisayuki; Takahashi, Minoru; Shinoda, Katsuro; Kikyotani, Sho; and Inagaki, Hiroshi, 4,141,888, Cl. 260-123.700.

Kilpatrick, John S., to Rupert's Certi-Fresh Foods, Inc. Preparation of frozen raw battered products. 4,142,001, Cl. 426-302.000.

Kimball International, Inc.: *See*—
Slaats, Mathew A.; Welsh, Alan B.; and Bray, Wade R., 4,142,139, Cl. 318-603.000.

Kimberlin, Dan W.: *See*—
De Wolf, Frank T.; and Kimberlin, Dan W., 4,141,137, Cl. 29-596.000.

Kimura, Tatsuya: *See*—
Mizushima, Yoshihiko; Kajiyama, Kenji; Kimura, Tatsuya; and Kanbe, Hiroshi, 4,142,200, Cl. 357-30.000.

King Radio Corporation: *See*—
Quick, Gary K., 4,141,138, Cl. 29-740.000.

Kiovsky, Thomas E., to Shell Oil Company. Star-shaped polymer reacted with dicarboxylic acid and amine as dispersant viscosity index improver. 4,141,847, Cl. 252-51.50A.

Kirchweger, Karl; Fachbach, Heinz; and Thien, Gerhard, to List, Hans. Motor vehicle with a noise suppressing engine encapsulation. 4,141,427, Cl. 180-69.00R.

Kirillov, Alexandr I.: *See*—
Domrachev, Georgy A.; Khamylov, Vyacheslav K.; Bochkarev, Mikhail N.; Zhuk, Boris V.; Kaverin, Boris S.; Nesterov, Boris A.; and Kirillov, Alexandr I., 4,141,778, Cl. 156-613.000.

Kirkpatrick, Joel L., to Gulf Oil Corporation. Combating weeds in soybeans. 4,141,717, Cl. 71-90.000.

Kirnos, Ariadna B.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Kita, Toru; and Fujishiro, Takeshi, to Nissan Motor Company, Limited. Oxygen sensor particularly useful in exhaust system of automotive engine. 4,141,813, Cl. 204-195.00S.

Kitamoto, Tatsuji: *See*—
Aonuma, Masashi; Tamai, Yasuo; Kitamoto, Tatsuji; and Kodama, Fumio, 4,141,763, Cl. 148-105.000.

Klassen, George; and Feller, Murray D., to Lockheed Petroleum Services, Ltd. Pup measurement gauge. 4,141,147, Cl. 33-174.00N.

Kleer-Vu Industries, Inc.: *See*—
Mascolo, Peter, 4,141,162, Cl. 40-536.000.

Klein, Carlton: *See*—
Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton, 4,141,956, Cl. 422-116.000.

Klein, Erich; Thomel, Frank; and Struwe, Hartmut, to Dragoco Gerberding & Co. GmbH. Process for manufacturing alkyl-substituted β-resorcyclic acid esters. 4,142,053, Cl. 560-67.000.

Kleinknecht, Hans P.; and Kane, James, to RCA Corporation. Optically monitoring the thickness of a depositing layer. 4,141,780, Cl. 156-626.000.

Klemz, David B., to Vickerys Limited. Doctors for paper-making machines. 4,141,112, Cl. 15-256.510.

Klendauer, Wolfgang: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,142,013, Cl. 428-36.000.

Klockner-Humboldt-Deutz: *See*—
Buchner, Heinrich, 4,141,154, Cl. 34-20.000.

Klockner-Humboldt Deutz AG: *See*—
Heckmann, Wolfgang; and Reulecke, Wilhelm, 4,141,837, Cl. 210-365.000.

Klose, Werner, to Hoechst Aktiengesellschaft. Production of acid orthophosphoric acid ester mixtures. 4,141,938, Cl. 260-928.000.

Kluting, Bernd; and Voss, Hans W., to Keiper Automobiltechnik GmbH & Co. KG. Actuator for motor-vehicle seat adjuster. 4,141,583, Cl. 296-65.00R.

Kmetz, Allan R., to BBC Brown, Boveri & Company, Limited. Procedure for addressing of visual display devices. 4,142,182, Cl. 340-765.000.

Knape & Vogt Manufacturing Co.: *See*—
Miller, Calvin K., 4,141,525, Cl. 248-251.000.

Knauer, Karl, to Siemens Aktiengesellschaft. Process for operating a charge-coupled arrangement in accordance with the charge-coupled device principle. 4,142,109, Cl. 307-221.00D.

Knight, William M., Jr.: *See*—
McCormack, Kent; and Knight, William M., Jr., 4,142,207, Cl. 358-113.000.

Knipstrom, Karl-Erik; Malm, Anders L.; and Andersson, Bror H., to Elektriska Svetsningsaktiebolaget. Method for tube welding. 4,142,085, Cl. 219-61.000.

Knutti, David: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; Johnson, R. Todd; Luntz, Richard; and Knutti, David, 4,141,359, Cl. 128-172.100.

Kobayashi, Hisashi: *See*—
Yamaguchi, Shigehiro; and Kobayashi, Hisashi, 4,141,762, Cl. 148-37.000.

Kobayashi, Nobuki: *See*—
Ozawa, Hiroshi; Torii, Yoshinori; Kobayashi, Nobuki; and Ishikawa, Koji, 4,142,018, Cl. 428-323.000.

Kobori, Kiyotomi: *See*—
Kato, Tetsuya; Ishitani, Akira; and Kobori, Kiyotomi, 4,142,031, Cl. 526-4.000.

Koch, Werner, to Sandoz Ltd. Substituted 2-imidazolin-5-ones. 4,142,043, Cl. 542-433.000.

Kodama, Fumio: *See*—
Aonuma, Masashi; Tamai, Yasuo; Kitamoto, Tatsuji; and Kodama, Fumio, 4,141,763, Cl. 148-105.000.

Kodama, Tsuneo; Sasaki, Isao; and Mori, Hiroshi, to Mitsubishi Rayon Co., Ltd. Polyester compositions. 4,141,882, Cl. 260-40.00R.

Kohjin Co., Ltd.: *See*—
Kanai, Tadashi; Maruyama, Osamu; and Aoki, Akiji, 4,142,041, Cl. 536-23.000.

Kohl, Karl, to Karl Mayer Textilmaschinen Fabrik GmbH. Jacquard

controlled warp knitting machine with slidable thread guides. 4,141,230, Cl. 66-204.000.

Kohshoh Limited: *See*—
Nodo, Taizo, 4,141,119, Cl. 24-250.000.

Koizumi, Kunihei; Ueda, Takeshi; Otani, Tatu; and Katata, Toshinobu, to Nippon Kokan Kabushiki Kaisha. Dry type method for quenching coke. 4,141,795, Cl. 201-39.000.

Kojima, Chiaki: *See*—
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,142,210, Cl. 358-128.000.

Kollmorgen Technologies Corporation: *See*—
Herrmann, Gunther, 4,142,099, Cl. 250-308.000.

Komiya, Yutaka: *See*—
Soma, Ikuo; Magome, Tamotu; and Komiya, Yutaka, 4,141,646, Cl. 355-10.000.

Koni B.V.: *See*—
Ellington, Kenneth L., 4,141,236, Cl. 73-11.000.

Koninklijke Nederlandse Papierfabrieken N.W.: *See*—
Gense, Johannes P., 4,141,488, Cl. 233-7.000.

Koninklijke Scholten-Honig N.V.: *See*—
Niemeijer, Klaas B., 4,141,839, Cl. 210-512.00M.

Konopnicki, Daniel T.: *See*—
Wu, Ching H.; Brown, Alfred; Konopnicki, Daniel T.; and Allen, Joseph C., 4,141,415, Cl. 166-252.000.

Kopfli, Markus: *See*—
Zetting, Alois; and Kopfli, Markus, 4,142,188, Cl. 340-558.000.

Korich, George P. Blade cartridge storage cap and razor holder. 4,141,445, Cl. 206-228.000.

Korpel, Adrianus, to Zenith Radio Corporation. Optical readout for reflective video discs. 4,142,098, Cl. 250-201.000.

Korshunov, Mikhail A.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Koschier, Angelo F., to Avco Corporation. Differentially geared regenerative reverse flow turbo shaft engine. 4,141,212, Cl. 60-39.16R.

Kosholkin, Valery N.: *See*—
Tsygankov, Mikhail S.; Kosholkin, Valery N.; Bitjutskaya, Nina A.; and Malandin, Oleg G., 4,142,027, Cl. 429-159.000.

Kosugi, Hiroshi: *See*—
Mizushima, Shigesaburo; and Kosugi, Hiroshi, 4,141,207, Cl. 57-243.000.

Kotschy, Josef; and Voelkl, Walter, to Siemens Aktiengesellschaft. Regenerable electric capacitor. 4,142,222, Cl. 361-273.000.

Koza, Francis R., to GTE Sylvania Incorporated. Discharge lamp having arched arc tube. 4,142,122, Cl. 313-220.000.

Kraft, Klaus; and Eimers, Erich, to Bayer Aktiengesellschaft. Accelerator mixture for unsaturated polyester resin compositions. 4,142,038, Cl. 528-288.000.

Krapf, Heinz: *See*—
Pfistermeister, Martin; Krapf, Heinz; and Coester, Erwin, 4,141,759, Cl. 148-6.350.

Krausz, Francois; and Calvet, Alain, to C M Industries. Derivatives of midecamycine. 4,141,971, Cl. 424-180.000.

Krick, Gerd E.: *See*—
Schael, Wilfried; Sigdell, Jan-Erik; and Krick, Gerd E., 4,141,835, Cl. 210-321.00A.

Krieger, Charles. Welt for cloth articles. 4,141,084, Cl. 2-247.000.

Kroeger, William C.; and Roper, Stephen J., to William B. Pollock Company, The. Hot metal ladle tilter. 4,141,540, Cl. 266-276.000.

Kroger, Harry, to Sperry Rand Corporation. Single active element controlled-inversion semiconductor storage cell devices and storage matrices employing same. 4,142,112, Cl. 307-238.000.

Krotkov, Vladimir N.: *See*—
Kalnin, Igor M.; Krotkov, Vladimir N.; Sutyrina, Taisia M.; Sergeeva, Anna N.; and Sergeev, Oleg A., 4,141,411, Cl. 165-151.000.

Krumbeck, Keith. Swimming pool apparatus for the handicapped. 4,141,089, Cl. 4-172.000.

Kubota Ltd.: *See*—
Murayama, Yoshinobu; Sada, Kenzo; and Kutomi, Mitsuhiro, 4,141,424, Cl. 180-53.0CD.

Kudlich, Hans, to Maschinenfabrik Peter Zimmer Aktiengesellschaft. Machine for applying patterns to a substrate. 4,141,231, Cl. 68-205.00R.

Kuechler, Irvin R., to Vent-Cair, Inc. Apparatus for extracting grease and smoke, and method and apparatus for installing the same. 4,141,342, Cl. 126-299.00D.

Kuenzler & Co.: *See*—
Maier, Jakob; and Hoefelmayr, Tilman, 4,141,319, Cl. 119-14.470.

Kufner Textilwerke KG: *See*—
Hefele, Josef, 4,141,313, Cl. 118-212.000.

Kugisawa, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Keyboard apparatus for an electronic musical instrument. 4,141,268, Cl. 84-1.030.

Kuhla, Donald E., to Pfizer Inc. Imidazo pyridinium quaternary salts as hypoglycemic agents. 4,141,898, Cl. 546-121.000.

Kuhn, Hans H., to Milliken Research Corporation. Liquid, water-insoluble polymeric colorants and aqueous dispersions containing same. 4,141,684, Cl. 8-39.00R.

Kuhne, Roland E.: *See*—
Duvochel, Henri P.; Kuhne, Roland E.; and Laurent, Bernard P., 4,142,242, Cl. 364-759.000.

Kulberg, Gerardus H.; Feiken, Jakob; and Freek, Siebe A., to G. D. Searle & Co. Cam and lever based sample transport. 4,141,444, Cl. 198-472.000.

Kumagai, Kimio; and Ishikawa, Masao, to Nissan Motor Company, Limited; and Ichikoh Industries Limited. Vehicle lamp casing optical axis adjusting mechanism. 4,142,228, Cl. 362-233.000.

Kumagai, Shinobu: *See*—
Ishikawa, Kenkichi; Kumagai, Shinobu; Hasegawa, Teruyuki; and Sakamoto, Akiyoshi, 4,141,249, Cl. 73-423.00R.

Kumar, Surinder: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,141,996, Cl. 426-44.000.

Kuno Moser GmbH: *See*—
Ebner, Albert; and Bauerle, Kurt, 4,141,352, Cl. 128-62.00A.

Kunstmann, Walter; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Process for the preparation of triamino benzenes by catalytic hydrogenation of 2,4-dinitro anilines. 4,141,917, Cl. 260-580.000.

Kuntz, Emile, to Rhone-Poulenc Industries. Telomerization process using sulfonated triarylphosphine and transition metal. 4,142,060, Cl. 568-840.000.

Kunz, Wilhelm; Posselt, Klaus; and Lohner, Manfred, to Doll GmbH. Novel salts of 1,3-bis-(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine in compositions having bacteriostatic activity. 4,141,968, Cl. 424-48.000.

Kunz, Wilhelm; and Posselt, Klaus, to Doll GmbH. Salts of 1,3-bis(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine. 4,142,050, Cl. 544-322.000.

Kurapin, Igor N.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,141,883, Cl. 260-45.80N.

Kuryluk, Michael H. Rotary picker for harvesting fruit. 4,141,204, Cl. 56-330.000.

Kutomi, Mitsuhiro: *See*—
Murayama, Yoshinobu; Sada, Kenzo; and Kutomi, Mitsuhiro, 4,141,424, Cl. 180-53.0CD.

Kuwabara, Katsutoshi; and Ishii, Kanji, to Hochiki Corporation. Two-wire system including signal receiving section and detection section with protected relay. 4,142,219, Cl. 361-18.000.

Kuznetsov, Sergei G.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Kuzovleva, Rimma G.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G., 4,141,925, Cl. 260-681.50C.

Kyte, Colin T.; Lewis, Geoffrey J.; Pearce, Edgar; and Hume, Keith, to Fosroc International Limited. Method of treating timber with composition having a colloidal pigment. 4,142,009, Cl. 427-297.000.

L & R Manufacturing Company: *See*—
Breining, Franklin E.; and Edelstein, Franklin H., 4,141,608, Cl. 310-316.000.

Laborfina S.A.: *See*—
Bracke, William J. I., 4,141,933, Cl. 260-880.00R.

LaChance, Ernest J. Secure bottle with novel cap. 4,141,461, Cl. 220-253.000.

Lacotte, Jean-Pierre: *See*—
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.

Lafer, Percival. Collapsible furniture structure. 4,141,590, Cl. 297-440.000.

Lake, Don W., to Comdial Corporation. Digital multitone generator for telephone dialing. 4,142,184, Cl. 340-347.0DA.

Lakernik, Mark M.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Lakhani, Kishor M., to Honeywell Information Systems Inc. Multiple applicator roller toner station. 4,141,317, Cl. 118-661.000.

Lakin, Kenneth M.: *See*—
Scott, Marion L.; and Lakin, Kenneth M., 4,142,212, Cl. 358-213.000.

Lambert, Herbert L., to Champion International Corporation. Slide top carton. 4,141,485, Cl. 229-17.0SC.

Lambregts, Antonius A., to Boeing Commercial Airplane Company. Independent glide slope gain programming system. 4,141,522, Cl. 244-186.000.

Lampe, John G.; and Whitley, Paul W., to Armstrong Cork Company. Embossed laminated board. 4,142,007, Cl. 428-165.000.

Landauer, Steven W.; and Dyke, Harry J., to Wescom, Inc. False framing detector. 4,142,070, Cl. 179-15.0BS.

Lang, Stanley A., Jr.; Lin, Yang-I; Fields, Thomas L.; Fabio, Paul F.; and Murdock, Keith C., to American Cyanamid Company. Cycloalkylcarboxyamidines and halobenzamidines as anti-amebic agents. 4,141,992, Cl. 424-326.000.

Lang, Vladimir: *See*—
Van Tassel, Norman L.; and Lang, Vladimir, 4,141,243, Cl. 73-119.00A.

Lange, Kai, to General Electric Company. Energy independent uniformity improvement for gamma camera systems. 4,142,102, Cl. 250-369.000.

Langston, Keith N.: *See*—
Bean, Bradford M.; Langston, Keith N.; Partridge, Richard L.; and Sy, Kian-Bon K., 4,142,234, Cl. 364-200.000.

Lanyi, Ernest S.: *See*—
Friend, Donald L.; Grosko, John A.; and Lanyi, Ernest S., 4,141,299, Cl. 105-260.000.

Lapadula, Constantino: *See*—
Hatzakis, Michael; Lapadula, Constantino; and Lin, Burn J., 4,142,107, Cl. 250-571.000.

Lapointe, Joseph A., to Domtar Inc. Chip thickness classifier. 4,141,451, Cl. 209-664.000.

Larsen, Kjell: *See*—
Anderssen, Tore; and Larsen, Kjell, 4,141,945, Cl. 264-63.000.

Laskow, William; and Morelock, Charles R., to General Electric Company. Method of making a shaped silicon carbide-silicon matrix composite and articles made thereby. 4,141,948, Cl. 264-101.000.

Lassman, Josef; and Nuglisch, Herbert, to Edeleanu Gesellschaft mbH. Apparatus for preventing an uncontrolled emission of gaseous hydrocarbons during the filling of containers. 4,141,394, Cl. 141-284.000.

Lasswell, Tull C. Menstrual extraction device. 4,141,360, Cl. 128-276.000.

Last, Anthony J., to Ontario Research Foundation. Ozone/ultraviolet water purifier. 4,141,830, Cl. 210-63.00Z.

Latko, Mary Ann: *See*—
Pavilcius, Audrone M.; and Latko, Mary Ann, 4,141,854, Cl. 252-301.10W.

Lattrell, Rudolf; Kief, Heinrich; and Bahr, Hermann, to Hoechst Aktiengesellschaft. Ferrocene derivatives. 4,141,991, Cl. 424-295.000.

Lau, John H. W.; and Margerum, C. James, to Canadian Patents and Development Limited. Pulsed coaxial thermal plasma sprayer. 4,142,089, Cl. 219-121.00P.

Laufer, Helmut, to Dual Gebruder Steidinger. Switching device for a tape recorder. 4,142,217, Cl. 360-90.000.

Laurent, Bernard P.: *See*—
Duvochel, Henri P.; Kuhne, Roland E.; and Laurent, Bernard P., 4,142,242, Cl. 364-759.000.

Lauwerijssen, Petrus C.; and Van Meer, Antonius J., to U.S. Philips Corporation. Fluorescent discharge lamp with inner hollow tube offset from envelope axis. 4,142,125, Cl. 313-485.000.

Lavigna, Robert J.: *See*—
Hill, David W.; Katz, Lewis E.; Lavigna, Robert J.; and Reusser, Raymond E., 4,141,779, Cl. 156-617.0SP.

Lavigne, William J., Jr.; and Leonard, Louis H., to Carrier Corporation. Dual flash and thermal economized refrigeration system. 4,141,708, Cl. 62-117.000.

Lavon, Erik V., to Atlas Copco Aktiebolag. Method and device for breaking hard compact material. 4,141,592, Cl. 299-16.000.

Lawhorn, John H.: *See*—
Ingram, Charles B.; and Lawhorn, John H., 4,142,159, Cl. 328-120.000.

Lawrence Brothers, Inc.: *See*—
Newlon, Robert L., 4,141,123, Cl. 29-11.000.

Lawrence, Dean M., to Caterpillar Tractor Co. Windshield wiper restraint device. 4,141,102, Cl. 15-250.160.

Lawton, Ernest L., II, to Monsanto Company. Polyester and process for making same. 4,141,928, Cl. 260-860.000.

Le Brasseur, Genevieve, to Societe Chimique des Charbonnages CdF Chimie. Process for removing catalyst residues from polyolefins. 4,142,039, Cl. 528-496.000.

Le Carvennec, Francois: *See*—
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.

Leclercq, Marius F.: *See*—
Duparque, Daniel A.; Grange, Andre A.; Morin, Daniel L.; and Leclercq, Marius F., 4,141,802, Cl. 204-15.000.

Lee, Arley G.: *See*—
Riordan, Mathew B.; and Lee, Arley G., 4,141,605, Cl. 308-26.000.

Lee, Thomas E. Microdispensing dilution system. 4,141,469, Cl. 222-135.000.

Leger, Violeta Z.; and Blomgren, George E., to Union Carbide Corporation. Nonaqueous cells utilizing aluminum, magnesium, and calcium anodes in amide-based electrolytes. 4,142,028, Cl. 429-194.000.

Lehnert, Daryl A. Events accumulator device and method. 4,142,096, Cl. 235-92.0EA.

Lehureau, Jean-Claude: *See*—
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.

Leiber, Heinz, to Robert Bosch GmbH. Anti-wheel-lock or anti-skid system for motor vehicles. 4,141,595, Cl. 303-10.000.

Leisure Life, Inc.: *See*—
Wall, Harlin J., 4,141,532, Cl. 249-94.000.

Lemanski, Joseph S., to R. E. Phelon Company, Inc. Breaker point assembly. 4,142,077, Cl. 200-19.00A.

Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton. Cold sterilizer. 4,141,956, Cl. 422-116.000.

Lempke, George D.; and Hakanson, Nils L., to A.B. Dick/Scott. Method and apparatus of aperture flooding. 4,141,647, Cl. 355-10.000.

Lenk, Arthur, to STEAG Aktiengesellschaft. Flow-limiting device for a pipe carrying a fluid or gaseous medium. 4,141,380, Cl. 137-513.500.

Lenoir, John; and Marthaler, Max, to Ciba-Geiby AG. Photographic developing process. 4,141,734, Cl. 96-53.000.

Leonard, Louis H.: *See*—
Lavigne, William J., Jr.; and Leonard, Louis H., 4,141,708, Cl. 62-117.000.

Leutgab, Hermann, to Goetze AG. Device for the centered clamping of annular workpieces. 4,141,263, Cl. 82-45.000.

Lever Brothers Company: *See*—
Augustijn, Govert J. P.; and Beun, Jacobus H., 4,141,467, Cl. 222-38.000.

Levin, Gilbert V.; Tarnay, Alexandra G.; Topol, George J., deceased; and by Citizens Bank and Trust Company, legal representative, to Union Carbide Corporation. Phosphate stripping of sewage. 4,141,822, Cl. 210-6.000.

Levine, Robert A.: *See*—
Wardlaw, Stephen C.; and Levine, Robert A., 4,141,654, Cl. 356-243.000.

Levinsky, Roland J.: *See*—
Soothill, John F.; and Levinsky, Roland J., 4,141,965, Cl. 424-12.000.

Levinsohn, Ronald; and Baron, Martin. Dust ruffle. 4,141,097, Cl. 5-333.000.

Levy, Joseph; and Fusee, Murray C., to UOP Inc. Support matrices for immobilized enzymes. 4,141,857, Cl. 252-430.000.

Lewis, Elizabeth A.: *See*—
Jabarin, Saleh A.; and Lewis, Elizabeth A., 4,142,040, Cl. 528-502.000.

Lewis, Geoffrey J.: *See*—
Kyte, Colin T.; Lewis, Geoffrey J.; Pearce, Edgar; and Hume, Keith, 4,142,009, Cl. 427-297.000.

Lewis, James H. Disposable liquid sterilizer unit. 4,141,686, Cl. 250-436.000.

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Michel, Max: *See—*
Dupuy, Georges; Daumas, Jean-Claude; and Michel, Max, 4,141,962, Cl. 423-571.000.
Michel, Walter A.; and Hagenbart, Donald E., to R. R. Donnelley & Sons, Inc. Signature verifier with indicia sensor. 4,141,492, Cl. 235-437.000.
Microtime, Inc.: *See—*
Faroudja, Yves C., 4,142,211, Cl. 358-167.000.
Midcon Pipeline Equipment Co.: *See—*
Smith, Carl K., 4,141,[illegible]14, Cl. 210-17.000.
Middleton, William J., to Du Pont de Nemours, E. I., and Company. Hydroxyquinazolines and their use as intermediates for pharmaceutical agents. 4,141,895, Cl. 260-239.30D.
Miles Laboratories, Inc.: *See—*
Lolas, George M., 4,141,999, Cl. 426-104.000.
Morris, David A. N.; Rupchock, Patricia A.; and Skarstedt, Mark T., 4,141,688, Cl. 23-230.00B.
Millar, Robert F.: *See—*
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., 4,141,690, Cl. 422-216.000.
Miller, Calvin K., to Knape & Vogt Manufacturing Co. Universal drawer slide mounting bracket. 4,141,525, Cl. 248-251.000.
Miller, Donald M., to United States of America, Energy. Gage for micromachining system. 4,141,150, Cl. 33-174.00P.
Miller, Harry B., to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Device for accelerating yarn winder chucks. 4,141,513, Cl. 242-18.00A.
Miller, Harry B., to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Standby chuck operating mechanism. 4,141,514, Cl. 242-18.00A.
Miller, James A.; and Snyder, William L., to Deere & Company. Controls for actuating a direction control valve to and releasing it from a float-effecting condition. 4,141,382, Cl. 137-596.150.
Miller, Patrick D.: *See—*
Cutler, Ivan B.; and Miller, Patrick D., 4,141,740, Cl. 106-44.000.
Miller, Ralph, to DTPM Corporation. Production of H_2S from SO_2 obtained from flue gas. 4,141,961, Cl. 423-563.000.
Miller, Ralph, to Ciba-Geigy Corporation. Thermal decomposition of metal nitrates. 4,141,963, Cl. 423-592.000.
Milliken, Douglas A.: *See—*
Hirschkoff, Sidney; and Milliken, Douglas A., 4,141,143, Cl. 30-381.000.
Milliken Research Corporation: *See—*
Kuhn, Hans H., 4,141,684, Cl. 8-39.00R.
Minagawa, Yoshisato; Arai, Naoki; and Ueda, Takehiko, to Fuji Photo Film Co., Ltd. Multilayer color photographic materials. 4,141,730, Cl. 96-9.000.
Minbiole, Barry A., to Union Carbide Corporation. Apparatus for removal of solids from a sedimentation zone. 4,141,831, Cl. 210-195.00S.
Minbiole, Barry A., to Union Carbide Corporation. Apparatus for removal of solids from a sedimentation zone. 4,141,832, Cl. 210-195.00S.
Minnesota Mining and Manufacturing Company: *See—*
Canty, George, 4,141,736, Cl. 96-87.00R.
Ward, Gene R., 4,141,530, Cl. 248-629.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hayashi, Toshio; Ueda, Hiroshi; and Oyokota, Shigeru, 4,141,637, Cl. 354-219.000.
Mintz, S. Stanley, to Hewlett-Packard Company. Field programmable read-only-memory. 4,142,251, Cl. 365-181.000.
Mishcon, Lester, deceased (by Mishcon, Martha, executrix); and Agulnek, Harry, to Vanguard Supreme Machine Corporation. Plate assembly for a circular knitting machine. 4,141,227, Cl. 66-229.000
Mishcon, Martha, executrix: *See—*
Mishcon, Lester, deceased; and Agulnek, Harry, 4,141,227, Cl. 66-229.000.
Mitchell, Robert L., to Colgate-Palmolive Company. Dentifrices containing amorphous silica. 4,141,969, Cl. 424-52.000.
Mitchell, Roger E. Photocomposing machine. 4,141,632, Cl. 354-14.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nakata, Josuke; and Kameda, Tohru, 4,142,115, Cl. 307-315.000.
Satoh, Tsuyoshi, 4,141,435, Cl. 187-29.00R.
Mitsubishi Rayon Co., Ltd.: *See—*
Kodama, Tsuneo; Sasaki, Isao; and Mori, Hiroshi, 4,141,882, Cl. 260-40.00R.
Matsumura, Hiroshi; Tokutomi, Takashi; and Matsuzawa, Hideo, 4,142,058, Cl. 562-600.000.
Mitsuda, Tadao; Yasuda, Takeru; and Fukumori, Yoshiki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning apparatus of an internal combustion engine. 4,141,214, Cl. 60-276.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Ozawa, Hiroshi; Torii, Yoshinori; Kobayashi, Nobuki; and Ishikawa, Koji, 4,142,018, Cl. 428-323.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Noguchi, Hironori, 4,141,148, Cl. 33-174.00P.
Mitzel, Robert B.: *See—*
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Miura, Shuji: *See—*
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Miyado, Shinji: *See—*
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.
Miyakawa, Seiichi; and Yano, Takashi, to Ricoh Company, Ltd. Electrostatic copying machine comprising improved magnetic brush developing-cleaning unit. 4,142,165, Cl. 355-14.000.
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Hasegawa, Tetsuo; Touma, Hitoshi; Satomi, Kunio; and Miyamae, Tatsuo, 4,141,849, Cl. 252-62.10P.
Miyashita, Kiyoshi: *See—*
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Miyata, Takeo: *See—*
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Miyazaki, Takaaki: *See—*
Hibino, Shinichi; Miyazaki, Takaaki; and Nakayama, Keiji, 4,141,853, Cl. 252-299.000.
Mizuguchi, Saburo; Nomura, Isao; Naito, Takeyuki; Onodera, Masato; and Saito, Kouji, to Ebara Manufacturing Co., Ltd. Process for recovery of chemicals from pulping waste liquor. 4,141,785, Cl. 162-36.000.
Mizushima, Shigesaburo; and Kosugi, Hiroshi. Process for producing curl shrunk silk yarn. 4,141,207, Cl. 57-243.000.
Mizushima, Yoshihiko; Kajiyama, Kenji; Kimura, Tatsuya; and Kanbe, Hiroshi, to Nippon Telegraph & Telephone Corp. Semiconductor photodiodes. 4,142,200, Cl. 357-30.000.
Mobil Oil Corporation: *See—*
Abdo, Milton K., 4,141,842, Cl. 252-8.55D.
Braid, Milton, 4,141,848, Cl. 252-51.50A.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,141,859, Cl. 252-455.00Z.
Mochizuki, Nobuo: *See—*
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Molis, Stephen J.: *See—*
Darby, William L.; Monz, Robert H.; and Molis, Stephen J., 4,141,669, Cl. 408-1.00R.
Mollenberg-Betz Machine Company: *See—*
Witter, James S., 4,142,136, Cl. 318-779.000.
Mollura, Carlos A. Method of making a baffled waterbed. 4,141,770, Cl. 156-218.000.
Moltrasio, Mario, to Ventomatic Italiana S.r.l. Apparatus for automatic insertion of valved bags on bag-filling machines. 4,141,392, Cl. 141-98.000.
Monier Colourtile Pty. Ltd.: *See—*
Aarons, Raymond J., 4,141,191, Cl. 52-715.000.
Monroe Auto Equipment Company: *See—*
Sorensen, Ronald L., 4,141,572, Cl. 280-707.000.
Monsanto Company: *See—*
Blackburn, William A.; and Goodwin, Roy D., 4,142,017, Cl. 428-284.000.
Coran, Aubert Y.; and Patel, Raman, 4,141,863, Cl. 260-3.000.
Coran, Aubert Y.; and Patel, Raman, 4,141,878, Cl. 260-33.6AQ.
Deets, Gary L.; and Nemphos, Speros P., 4,141,931, Cl. 260-876.00R.
Kauffman, Ivan L.; and Kellogg, Robert C., 4,141,680, Cl. 425-529.000.
Lawton, Ernest L., II, 4,141,928, Cl. 260-860.000.
Perry, Glen D., 4,142,016, Cl. 428-284.000.
Monz, Robert H.: *See—*
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Moon, Tag Y.; and Cooper, Ronald H., to Dow Chemical Company, The. Method of preventing surface cracking of portland cement mortar and concrete containing a film forming polymer modifier. 4,141,737, Cl. 106-12.000.
Moore, James D.: *See—*
Beny, Janos; Moore, James D.; and Ryan, John W., 4,141,553, Cl. 273-86.00B.
Moran, Michael W.; and Bergman, Lawrence A., to Lord Corporation. Rotary blade retention system. 4,141,664, Cl. 403-53.000.
Moraw, Roland, to Hoechst Aktiengesellschaft. Process and apparatus

for recording and optically reproducing X-ray images. 4,142,100, Cl. 250-315.00A.
Morel, Philippe: *See*—
Henry, Raymond; and Morel, Philippe, 4,141,136, Cl. 29-590.000.
Moreland, James E., to Malvern Minerals Company. Process for preparing modified particulate and/or fibrous, crystalline and amorphous inorganic substances. 4,141,751, Cl. 106-308.00Q.
Morelock, Charles R.: *See*—
Laskow, William; and Morelock, Charles R., 4,141,948, Cl. 264-101.000.
Morgan, William M.: *See*—
Barclay, Donald J.; and Morgan, William M., 4,141,803, Cl. 204-51.000.
Mori, Hiroshi: *See*—
Kodama, Tsuneo; Sasaki, Isao; and Mori, Hiroshi, 4,141,882, Cl. 260-40.00R.
Mori, Kazumasa; and Sato, Suguru, to Nippondenso Co., Ltd. Electrical generating system, particularly for automotive use. 4,141,613, Cl. 322-28.000.
Moricca, Anthony C.; and Humphreys, Dwight S., to Moricca, Anthony C. Scanning system and method using coincidence of variable frequency pulses. 4,142,181, Cl. 340-781.000.
Morin, Daniel L.: *See*—
Duparque, Daniel A.; Grange, Andre A.; Morin, Daniel L.; and Leclercq, Marius F., 4,141,802, Cl. 204-15.000.
Morozenko, Vadim N.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.
Morris, Arthur J.; and Garner, James K., Jr., to Camco, Incorporated. Hydraulic actuated weight set well packer. 4,141,413, Cl. 166-120.000.
Morris, David A. N.; Rupchock, Patricia A.; and Skarstedt, Mark T., to Miles Laboratories, Inc. Composition, device and method for determining reducing agents. 4,141,688, Cl. 23-230.00B.
Morris, Wilford V.; and Sheary, George W., III, to Summa Corporation. Method and apparatus for deep sea mining. 4,141,159, Cl. 37-58.000.
Morrison, John E., Jr.; and Abrams, Charlie F., Jr., to United States of America, Agriculture. Furrow opener and apparatus for no-tillage transplanters and planters. 4,141,302, Cl. 111-52.000.
Morrow, Richard H.; and Stetzler, Grant F., to Western Electric Company, Inc. High-speed measurement of I_{CEO} in transistors and opto-isolators. 4,142,150, Cl. 324-158.00T.
Morson, Mary S.: *See*—
Glassman, Wayne C.; Melbourne, Sydney H.; Morson, Mary S.; and Soomet, Urmas, 4,141,758, Cl. 148-6.200.
Morton, Arthur F.: *See*—
Cole, Albert V.; and Morton, Arthur F., 4,141,442, Cl. 198-429.000.
Mory, Rudolf; and Muller, Rolf, to Ciba-Geigy Corporation. Quinolone-azo-acetoacetamino quinolone pigments. 4,141,891, Cl. 260-155.000.
Moser, Werner: *See*—
Bommersheim, Hans; Hettich, Bernhard; Keller, Helmut; Moser, Werner; and Tauchert, Klaus, 4,141,660, Cl. 400-124.000.
Moss Rosenberg Verft a.s.: *See*—
Tonnessen, Arne, 4,141,465, Cl. 220-445.000.
Moss, Thomas. Litter retrieving device. 4,141,579, Cl. 294-61.000.
Mostek Corporation: *See*—
Dozier, Harold W., 4,142,176, Cl. 340-166.00R.
Green, Robert S., 4,142,114, Cl. 307-304.000.
Guritz, Elmer H., 4,142,118, Cl. 307-358.000.
Motorenfabrik Hatz GmbH & Co. KG: *See*—
Hatz, Ernst; and Absenger, Erich, 4,141,334, Cl. 123-198.00E.
Hatz, Ernst, 4,141,422, Cl. 180-1.00F.
Motorola, Inc.: *See*—
Davis, Walter L., 4,142,177, Cl. 340-171.00R.
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Moyer, Norman E.: *See*—
Whipple, John N.; Moyer, Norman E.; and Merles, Irving B., 4,141,208, Cl. 58-23.0AC.
Muddiman, Robert C., to Hunt, Waller B. Fish lure. 4,141,171, Cl. 43-42.470.
Muehl, Lawrence L., to Dakota Cat Eye Inc. Waterfowl decoy setting means. 4,141,167, Cl. 43-2.000.
Mueller Co.: *See*—
Daghe, Joseph L., 4,141,537, Cl. 251-306.000.
Stansifer, Dennis N.; and Henderson, Ralph W., 4,141,574, Cl. 285-92.000.
Mueller, Martin; and St. Clair, David, to Owens-Illinois, Inc. Method and apparatus for forming a tamper-proof closure for a container. 4,141,195, Cl. 53-412.000.
Mues, Volker; and Niggemann, Johannes, to Bayer Aktiengesellschaft. Fertilizers for supplying plants with micronutrients. 4,141,714, Cl. 71-27.000.
Mulchi, Charles L., to Wolf, Stanley I., a part interest. Air-pollution filter and face mask. 4,141,703, Cl. 55-316.000.
Mullen, Delmar E. Method and apparatus for prevening improper string return. 4,141,271, Cl. 84-312.00P.
Muller, Rolf: *See*—
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Multi-Elmac Company: *See*—
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Multinorm, B.V.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,141,202, Cl. 56-295.000.
Munnich, Hermann, to SKF Kugellagerfabriken GmbH. Holding disk for a boreless grinding wheel. 4,141,181, Cl. 51-168.000.
Murai, Tohsuke; and Tamura, Yuichi, to Nihon Boshoku Kogyo Kabushiki Kaisha. Aluminum alloy for galvanic anode. 4,141,725, Cl. 75-146.000.
Muramatsu, Fumio: *See*—
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Murao, Sawao: *See*—
Nishino, Toyokazu; Hamagishi, Yasutaro; Oki, Toshikazu; and Murao, Sawao, 4,141,972, Cl. 424-180.000.
Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,142,164, Cl. 333-73.00W.
Ogawa, Toshio; Mashio, Tasuku; and Nishiyama, Hiroshi, 4,142,124, Cl. 310-360.000.
Murayama, Yoshinobu; Sada, Kenzo; and Kutomi, Mitsuhiro, to Kubota Ltd. Transmission for tractors. 4,141,424, Cl. 180-53.0CD.
Murdock, Keith C.: *See*—
Lang, Stanley A., Jr.; Lin, Yang-I; Fields, Thomas L.; Fabio, Paul F.; and Murdock, Keith C., 4,141,992, Cl. 424-326.000.
Myers, Harry K., Jr.: *See*—
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Nabisco, Inc.: *See*—
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Nagai, Hisomu: *See*—
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Nagai, Kiyoshi; Ikeda, Hitoshi; and Handa, Takayuki, to Japan Radio Company, Ltd. Optical fiber cathode ray tubes and copy machines using the same. 4,141,641, Cl. 355-1.000.
Nagai, Kiyoshi; Ohashi, Hiroshi; and Ohiwa, Takao, to Japan Radio Company, Ltd. Optical fiber cathode ray tubes and copy machines using the same. 4,141,642, Cl. 355-1.000.
Nagashima, Takashi: *See*—
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Nagel, Martin J.: *See*—
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Nakagawa, Daisuke: *See*—
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Nakajima, Nobuyuki, to Fukuoka Tokushugarasu Kabushiki Kaisha; and Seibu Polymer Kasei Kabushiki Kaisha. High refractive index glass composition. 4,141,742, Cl. 106-47.00R.
Nakamura, Satoshi: *See*—
Tsukada, Toshihisa; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,142,160, Cl. 331-94.50H.
Nakanishi, Yoichi: *See*—
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Nakata, Josuke; and Kameda, Tohru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with a thermal protective device. 4,142,115, Cl. 307-315.000.
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., to Eli Lilly and Company. Deoxynarasin antibiotics. 4,141,907, Cl. 260-345.70R.
Nakayama, Hiroshi, to Hochiki Corporation. Dual frequency alarm device using Doppler effect for sensing a moving object. 4,142,187, Cl. 340-554.000.
Nakayama, Keiji: *See*—
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Nakazawa, Itta; Kada, Isamu; and Fukutomi, Yoshiaki, to Toray Textiles Inc. Wash-and-wear coat. 4,141,082, Cl. 2-93.000.
Nalco Chemical Company: *See*—
Albanese, Vincent M., 4,141,697, Cl. 55-5.000.
Pavilcius, Audrone M.; and Latko, Mary Ann, 4,141,854, Cl. 252-301.10W.
Nametz, Richard C.; and Burleigh, Peter H., to Velsicol Chemical

Corporation. Flame retarded nylon composition. 4,141,880, Cl. 260-37.00N.
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Elliegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., to Bayer Aktiengesellschaft. Apparatus for coating fibers, threads and sheets. 4,141,315, Cl. 118-420.000.
National Casein of New Jersey: *See—*
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National Distillers and Chemical Corporation: *See—*
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National Patent Development Corporation: *See—*
Weiss, Jonas; and Stockel, Richard F., 4,141,755, Cl. 134-42.000.
National Patent Search Associates, Inc.: *See—*
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National Research Development Corporation: *See—*
Allen, David W.; Richardson, John A.; and Sutherland, Ian A., 4,141,345, Cl. 128-2.00S.
Bergman, Imanuel, 4,141,689, Cl. 23-232.00R.
Soothill, John F.; and Levinsky, Roland J., 4,141,965, Cl. 424-12.000.
Nations, Roger L.: *See—*
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Negro, Guido; Mann, Frider; and Buck, Hermann, to Bielomatik Leuze & Company. Pads. 4,141,099, Cl. 11-1.00A.
Nelson, Joseph W.: *See—*
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Nelson, Paul M., to Wilson Industries, Inc. Bottom hole survey apparatus. 4,141,153, Cl. 33-286.000.
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Nesterov, Boris A.: *See—*
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Newland, Gordon C.; Pacifici, James G.; and Young, David A., to Eastman Kodak Company. Manganese carbonyl-sulfonyl chloride photoinitiators for radiation polymerizable unsaturated compounds. 4,141,808, Cl. 204-159.240.
Newlon, Robert L., to Lawrence Brothers, Inc. Method of manufacturing a spring hinge. 4,141,123, Cl. 29-11.000.
Newson, David C., to GAF Corporation. Photocopying systems. 4,141,314, Cl. 118-246.000.
Newson, John C.; Tregoning, Geoffrey R.; and Digby, James B., to Westinghouse Brake & Signal Co., Ltd. Vehicle door arrangements. 4,141,179, Cl. 49-316.000.
Newton, Albert E.: *See—*
Kelley, John S.; and Newton, Albert E., 4,141,464, Cl. 220-267.000.
Newton, David F.: *See—*
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Nichiryo Co., Ltd.: *See—*
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Nichols, William C. Guard for a horse's tail in a tail set. 4,141,197, Cl. 54-1.000.
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Niedermeyer, William P. Solar energy collector. 4,141,340, Cl. 126-271.000.
Nielsen, Donald R., to PPG Industries, Inc. Hydrogenation of glycolic acid. 4,141,930, Cl. 568-864.000.
Nielsen, Edwin A., to Ideal Toy Corporation. Toy drone car game. 4,141,552, Cl. 273-86.00B.
Nielsen, Niels E. M.: *See—*
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Niemeijer, Klaas B., to Koninklijke Scholten-Honig N.V. Multihydrocyclone. 4,141,839, Cl. 210-512.00M.
Niggemann, Johannes: *See—*
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Nightingale, Douglas J., to Rolls-Royce (1971) Limited. Nozzles for gas turbine engines. 4,141,501, Cl. 239-265.390.
Nihon Boshoku Kogyo Kabushiki Kaisha: *See—*
Murai, Tohsuke; and Tamura, Yuichi, 4,141,725, Cl. 75-146.000.
Niida, Taro: *See—*
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.
Nilsen, Tor N. Collapsible side walls for a packing case. 4,141,486, Cl. 229-23.00C.
Nilson, Billy N., to KeNova AB. Locking device for a self-closing closure. 4,141,475, Cl. 222-494.000.
Nilson, Nils B., to KeNova AB. Self-closing closure utilizing a single diaphragm. 4,141,474, Cl. 222-493.000.
Nilssen, Ole K.: *See—*
Goss, Stanley B.; Nagel, Martin J.; and Nilssen, Ole K., 4,142,216, Cl. 360-72.000.
Nilsson, Sven W., to SKF Nova AB. Mechanism for transferring a rotary motion into an axial motion. 4,141,255, Cl. 74-25.000.
Nippon Colin Co., Ltd.: *See—*
Shinoda, Masayuki, 4,141,350, Cl. 128-2.05S.
Nippon Electric Co., Ltd.: *See—*
Iinuma, Kazumoto, 4,142,205, Cl. 358-13.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Itakura, Kenji, 4,141,269, Cl. 84-1.220.
Sasahara, Yasumasa, 4,141,226, Cl. 64-17.00R.
Nippon Kogaku K.K.: *See—*
Saito, Kiyoji, 4,141,639, Cl. 354-289.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Ishikawa, Kenkichi; Kumagai, Shinobu; Hasegawa, Teruyuki; and Sakamoto, Akiyoshi, 4,141,249, Cl. 73-423.00R.
Kawawa, Takao; Imai, Ryoichiro; Tokunaga, Hisami; Nakano, Yutaka; and Sasaki, Naoaki, 4,141,812, Cl. 204-195.00S.
Koizumi, Kunihei; Ueda, Takeshi; Otani, Tatu; and Katata, Toshinobu, 4,141,795, Cl. 201-39.000.
Nippon Soda Company, Ltd.: *See—*
Okamura, Hiromichi; Kato, Iwao; Hiraoka, Michio; and Torium, Kinuko, 4,142,020, Cl. 428-403.000.
Nippon Steel Corporation: *See—*
Yamaguchi, Shigehiro; and Kobayashi, Hisashi, 4,141,762, Cl. 148-37.000.
Nippon Telegraph & Telephone Corp.: *See—*
Mizushima, Yoshihiko; Kajiyama, Kenji; Kimura, Tatsuya; and Kanbe, Hiroshi, 4,142,200, Cl. 357-30.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Adachi, Fumiyuki, 4,142,155, Cl. 325-47.000.
Ochi, Hiroshi, 4,142,192, Cl. 346-153.000.
Nippondenso Co., Ltd.: *See—*
Mori, Kazumasa; and Sato, Suguru, 4,141,613, Cl. 322-28.000.
Nishi, Chikao. Fish catcher. 4,141,168, Cl. 43-15.000.
Nishikawa, Masaji; and Miyashita, Kiyoshi, to Olympus Optical Company Limited. Improved shutter apparatus for electrophotographic apparatus. 4,141,650, Cl. 355-35.00C.
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Dielectric resonator of improved type. 4,142,164, Cl. 333-73.00W.
Nishimura, Matsuo: *See—*
Awano, Seiichi; and Nishimura, Matsuo, 4,141,343, Cl. 126-360.00A.
Nishino, Toyokazu; Hamagishi, Yasutaro; Oki, Toshikazu; and Murao, Sawao, to Sanraku-Ocean Co., Ltd. Purine nucleoside 5'-phosphate (mono, di or tri) 3'(2')-diphosphates and processes for their preparation. 4,141,972, Cl. 424-180.000.
Nishiyama, Hiroshi: *See—*
Ogawa, Toshio; Mashio, Tasuku; and Nishiyama, Hiroshi, 4,142,124, Cl. 310-360.000.
Nissan Motor Company, Limited: *See—*
Kita, Toru; and Fujishiro, Takeshi, 4,141,813, Cl. 204-195.00S.
Kumagai, Kimio; and Ishikawa, Masao, 4,142,228, Cl. 362-233.000.
Usui, Keizaburo; and Hayakawa, Yoshikazu, 4,141,240, Cl. 73-114.000.
Nissen, Ole J.: *See—*
Dyhr, Jan; and Nissen, Ole J., 4,141,223, Cl. 62-469.000.
Nissho-Iwai Co., Ltd.: *See—*
Aoki, Yutaka; Hase, Akira; Ito, Jiro; and Nagai, Hisomu, 4,141,793, Cl. 201-6.000.
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, to Meiji Seika Kaisha Ltd. Process for the preparation of 7-amino-cephem compounds using mold fungi. 4,141,790, Cl. 195-29.000.
Nocek, Stanley J., to Sun Chemical Corporation. Transfer arm assembly for plate making system. 4,141,457, Cl. 214-1.0BV.
Nodo, Taizo, to Kohshoh Limited. Plastic clip. 4,141,119, Cl. 24-250.000.
Noe, James C.: *See—*
Wieland, Kurt H.; Noe, James C.; and Emerson, Terence P., 4,141,672, Cl. 415-202.000.
Noguchi, Hironori, to Mitutoyo Mfg. Co., Ltd. Contour measuring apparatus. 4,141,148, Cl. 33-174.00P.
Nojiri, Chuhei: *See—*
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.
Nomura, Isao: *See—*
Mizuguchi, Saburo; Nomura, Isao; Naito, Takeyuki; Onodera, Masato; and Saito, Kouji, 4,141,785, Cl. 162-36.000.
Noranda Mines Limited: *See—*
Avedesian, Michael M.; and Holko, Anthony P., 4,141,804, Cl. 204-105.00R.
Norco Industries, Inc.: *See—*
John, Julius F., 4,141,526, Cl. 248-352.000.
Norman, Michael E.: *See—*
Harman, Julius; and Norman, Michael E., 4,141,281, Cl. 91-216.00R.
Norris, Geoffrey L. F.: *See—*
Davies, David H.; Ernill, Richard J.; and Norris, Geoffrey L. F., 4,141,974, Cl. 424-181.000.

Norris Industries, Inc.: *See*—
Hoos, Paul R., 4,141,234, Cl. 70-350.000.
North Atlantic Industries, Inc.: *See*—
Freilich, Arthur; and Kalron, Avraham, 4,142,241, Cl. 364-724.000.
Northern Telecom Limited: *See*—
Crooks, Basil D.; and Bennett, R. Brian P., 4,142,087, Cl. 219-90.000.
Jukes, John A.; and McGettigan, Philip A., 4,142,019, Cl. 428-380.000.
Pickar, Kenneth A.; and Wei, John S. S., 4,141,625, Cl. 350-171.000.
Northwestern University: *See*—
Meyer, Paul R., 4,141,368, Cl. 128-87.00B.
Norton, Wilson L., Jr.; and Risse, Willis H., to Air Refiner, Inc. Fin structure for air pre-cleaner. 4,141,700, Cl. 55-337.000.
Nowell, John R.: *See*—
Wilson, Edward A.; and Nowell, John R., 4,142,231, Cl. 363-141.000.
Nozawa, Takamitsu; Yamanaka, Nobuo; and Ogawa, Riichi, to Yoshino Kogyosho Co., Ltd. Cap for atomizer. 4,141,471, Cl. 222-182.000.
NRC, Inc.: *See*—
Vartanian, Haig, 4,141,720, Cl. 75-0.5BB.
Nuglisch, Herbert: *See*—
Lassman, Josef; and Nuglisch, Herbert, 4,141,394, Cl. 141-284.000.
Nutter, Benjamin P., to Schlumberger Technology Corporation. Safety valve hydraulically operated by telescopic drill stem movement. 4,141,418, Cl. 166-324.000.
Nyi, Kayson: *See*—
Emmons, William D.; and Nyi, Kayson, 4,141,868, Cl. 260-23.0AR.
O.M.A.C. Caprara S.a.s.: *See*—
Calzini, Mario, 4,141,480, Cl. 226-25.000.
Obi, Mikio: *See*—
Goga, Atsushi; Ikui, Takefumi; Obi, Mikio; and Kameda, Shinya, 4,141,534, Cl. 251-58.000.
Obiaya, Joseph O. Combustible concentration analyzer. 4,141,955, Cl. 422-95.000.
O'Brien, Merrill N., Jr., to Teepak, Inc. Oxazoline wax impregnated sausage casing. 4,141,749, Cl. 106-164.000.
Occidental Petroleum Corporation: *See*—
Choi, Charles K., 4,141,794, Cl. 201-12.000.
Ochi, Hiroshi, to Nippon Telegraph and Telephone Public Corporation. Electrographic process and apparatus with recording after toning. 4,142,192, Cl. 346-153.000.
O'Connor, Michael N. D.: *See*—
Coscia, Anthony T.; and O'Connor, Michael N. D., 4,141,827, Cl. 210-54.000.
Odenthal, Conrad J., to Tektronix, Inc. Box-shaped scan expansion lens for cathode ray tube. 4,142,128, Cl. 315-15.000.
Offermann, Paul F., to Chevron Research Company. Method and means for segmentally reducing heat output in a heat-tracing pipe. 4,142,093, Cl. 219-301.000.
Ogawa, Riichi: *See*—
Nozawa, Takamitsu; Yamanaka, Nobuo; and Ogawa, Riichi, 4,141,471, Cl. 222-182.000.
Ogawa, Toshio; Mashio, Tasuku; and Nishiyama, Hiroshi, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline ZnO with 0.01 to 20.0 atomic % Mn. 4,142,124, Cl. 310-360.000.
Ogren, Sven-Ove: *See*—
Carnmalm, Bernt S. E.; Lindberg, Ulf H. A.; De Paulis, Tomas; Ross, Svante B.; Stjernstrom, Nils-Erik; Ulff, Carl B. J.; and Ogren, Sven-Ove, 4,141,993, Cl. 424-330.000.
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, to UOP Inc. Hydrocracking catalyst. 4,141,860, Cl. 252-455.00Z.
Ohashi, Hiroshi: *See*—
Nagai, Kiyoshi; Ohashi, Hiroshi; and Ohiwa, Takao, 4,141,642, Cl. 355-1.000.
Ohiwa, Takao: *See*—
Nagai, Kiyoshi; Ohashi, Hiroshi; and Ohiwa, Takao, 4,141,642, Cl. 355-1.000.
Ohkawa, Tihiro, to General Atomic Company. Production of hydrogen. 4,141,805, Cl. 204-157.10H.
Ohki, Hiroshi: *See*—
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,142,210, Cl. 358-128.000.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Method of manufacturing a line guide ring for fishing rods. 4,141,132, Cl. 29-432.000.
Ohshima, Iwao: *See*—
Menju, Shiniti; and Ohshima, Iwao, 4,142,230, Cl. 363-51.000.
Ohta, Shoji: *See*—
Goshima, Takeshi; and Ohta, Shoji, 4,141,620, Cl. 350-6.800.
Ohya, Yoshinobu: *See*—
Ando, Ken; Kamosaki, Minoru; Ohya, Yoshinobu; and Asai, Sigeru, 4,141,774, Cl. 156-309.000.
Oita, Mashiro: *See*—
Shida, Sankichi; Okuma, Shinji; Oita, Mashiro; and Hirohata, Hyogo, 4,141,727, Cl. 75-232.000.
Oka, Masahiko; Tanigawa, Singo; Suzuki, Takesi; Tomoda, Masayasu; and Ueta, Yutaka, to Daikin Kogyo Co., Ltd. Fluorine-containing elastomeric copolymers, process for preparing the same and composition containing the same. 4,141,874, Cl. 260-29.60F.
Okada, Fukumatsu. Method of making a rotary engine rotor and bearing structure. 4,141,126, Cl. 29-156.40R.
Okada, Nobuhiko; Nakanishi, Yoichi; and Harada, Yoshiaki, to Osaka Gas Company, Limited. Process for treating waste water. 4,141,828, Cl. 210-63.00R.
Okada, Ryohei, to Aisin Seiki Kabushiki Kaisha. Thread cutting mechanism for sewing machines. 4,141,307, Cl. 112-292.000.
Okamura, Hiromichi; Kato, Iwao; Hiraoka, Michio; and Torium, Kinuko, to Nippon Soda Company, Ltd. Hetero-macrocyclic compound coated on the surface of solid. 4,142,020, Cl. 428-403.000.
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, to Ricoh Company, Ltd. 1,3,4-Oxadiazole derivatives and electrophotographic plates containing same. 4,141,729, Cl. 96-1.50R.
Oki, Toshikazu: *See*—
Nishino, Toyokazu; Hamagishi, Yasutaro; Oki, Toshikazu; and Murao, Sawao, 4,141,972, Cl. 424-180.000.
Okuma, Shinji: *See*—
Shida, Sankichi; Okuma, Shinji; Oita, Mashiro; and Hirohata, Hyogo, 4,141,727, Cl. 75-232.000.
Okusho, Susumu: *See*—
Yamazaki, Masaru; Okusho, Susumu; and Anami, Takayuki, 4,142,214, Cl. 358-257.000.
Olcer, Behzat, to Martin Automatic, Inc. Apparatus for adjusting the lateral position of a rolled web. 4,141,517, Cl. 242-68.300.
Oleinik, Vladimir I.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.
Oliver Machinery Company: *See*—
Blanding, Kenneth R., 4,141,196, Cl. 53-550.000.
Olmstead, Michael M.: *See*—
Brooks, Norman B.; and Olmstead, Michael M., 4,141,458, Cl. 214-301.000.
Olofson, Roy A.; and Pepe, Joseph P., to Research Corporation. N-dealkylation of N-alkyl-14-hydroxymorphinans and derivatives thereof. 4,141,897, Cl. 546-45.000.
Olschewski, Wilfred W., to Burr-Brown Research Corporation. Interface circuit and method for telephone extension lines. 4,142,075, Cl. 179-170.0NC.
Olson, Harris S., to Caterpillar Tractor Co. Cutting edge with wear-resistant material. 4,141,160, Cl. 37-141.00R.
Olson, Stephen R., to Iowa Beef Processors, Inc. Dispenser for sheet material. 4,141,516, Cl. 242-55.530.
Olszewski, Anthony R.: *See*—
Luttinger, Manfred; Olszewski, Anthony R.; and Parnell, Donald R., 4,141,877, Cl. 260-37.0EP.
Olt, Arthur E., Jr.: *See*—
Cline, Michael I.; and Olt, Arthur E., Jr., 4,141,423, Cl. 180-9.600.
Olympus Optical Company Limited: *See*—
Nishikawa, Masaji; and Miyashita, Kiyoshi, 4,141,650, Cl. 355-35.00C.
Shigetomi, Sadao, 4,141,954, Cl. 422-64.000.
Takahashi, Naoyuki, 4,142,080, Cl. 200-86.500.
Yamazaki, Masaru; Okusho, Susumu; and Anami, Takayuki, 4,142,214, Cl. 358-257.000.
O'Mahony, John P.: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,141,996, Cl. 426-44.000.
Omori, Shigeru: *See*—
Fumihiko, Takezoe; and Omori, Shigeru, 4,142,246, Cl. 364-900.000.
O'Neill, Cormac G., to Physics International Company. Gas-actuated fuel pump wherein the pump piston is driven by a spring. 4,141,675, Cl. 417-214.000.
Onodera, Masato: *See*—
Mizuguchi, Saburo; Nomura, Isao; Naito, Takeyuki; Onodera, Masato; and Saito, Kouji, 4,141,785, Cl. 162-36.000.
Ontario Research Foundation: *See*—
Last, Anthony J., 4,141,830, Cl. 210-63.00Z.
Ooba, Osamu, to Copal Company Limited. Focal plane shutter. 4,141,638, Cl. 354-246.000.
Oosterling, Pieter A.; and van Staveren, Hendricus C., to Multinorm, B.V. Mowing implement. 4,141,202, Cl. 56-295.000.
Oppenheimer, Robert H.: *See*—
George, Harvey F.; Marrara, Charles G.; and Oppenheimer, Robert H., 4,141,149, Cl. 33-178.00D.
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, to Thomson-Brandt. System for automatically correcting the duty factor of the carrier wave arising from reading-out a data carrier. 4,142,208, Cl. 358-127.000.
Orlov, Gennady I.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.
Orlov, Jury V.: *See*—
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovlevs, Rimma G., 4,141,925, Cl. 260-681.50C.
Orpana, Robert J., to Panatrac Manufacturing Corporation Limited. Traction element for a vehicle track. 4,141,600, Cl. 305-36.000.
Ory, Jean-Marie; and Hummer, Jacques, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process and device for the in vivo measurement of bone consolidation. 4,141,349, Cl. 128-2.00S.

Osaka Gas Company, Limited: *See*—
Okada, Nobuhiko; Nakanishi, Yoichi; and Harada, Yoshiaki, 4,141,828, Cl. 210-63.00R.
Osaka Iron & Steel Co., Ltd.: *See*—
Takai, Kiyoshi; Yamamoto, Naraharu; and Yamamoto, Seiichi, 4,141,722, Cl. 75-24.000.
Osaka Oxygen Industries, Ltd.: *See*—
Kawawa, Takao; Imai, Ryoichiro; Tokunaga, Hisami; Nakano, Yutaka; and Sasaki, Naoaki, 4,141,812, Cl. 204-195.00S.
Osakabe, Kuniharu: *See*—
Ando, Kunio; Hirota, Ryoichi; Osakabe, Kuniharu; and Maruyama, Koichi, 4,142,131, Cl. 315-368.000.
Osberghaus, Rainer; and Blum, Helmut, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Cosmetic deodorant preparations containing alkane diphosphonic acid esters. 4,141,967, Cl. 424-47.000.
Osceola Clutch & Brake Company: *See*—
Lunde, James M.; and Schwartz, John G., Jr., 4,141,439, Cl. 192-18.00R.
Oshikubo, Yuji, to Nichiryo Co., Ltd. Pipetting device. 4,141,251, Cl. 73-425.600.
Oshima, Hikoji. Aerator for generating fine bubbles by supersonic wave action. 4,141,939, Cl. 261-1.000.
Osipow, Lloyd I.: *See*—
Spitzer, Joseph G.; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 4,141,472, Cl. 222-189.000.
Ostrenko, Viktor Y.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.
Otani, Tatu: *See*—
Koizumi, Kunihei; Ueda, Takeshi; Otani, Tatu; and Katata, Toshinobu, 4,141,795, Cl. 201-39.000.
Oticon Electronics A/S: *See*—
Berland, Ole, 4,142,072, Cl. 179-107.0FD.
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, to Sony Corporation. Rotatable record carrier and method and apparatus for producing same. 4,142,210, Cl. 358-128.000.
Otte, Hubert J.; and Roosman, Gosta. Film storage and developing cassette. 4,142,193, Cl. 354-313.000.
Owens-Illinois, Inc.: *See*—
Jabarin, Saleh A.; and Lewis, Elizabeth A., 4,142,040, Cl. 528-502.000.
Mueller, Martin; and St. Clair, David, 4,141,195, Cl. 53-412.000.
Rapp, James E., 4,141,738, Cl. 106-39.600.
Zabor, Eric R., 4,141,711, Cl. 65-29.000.
Ownby, James C.: *See*—
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,141,884, Cl. 260-45.80N.
Oyokota, Shigeru: *See*—
Hayashi, Toshio; Ueda, Hiroshi; and Oyokota, Shigeru, 4,141,637, Cl. 354-219.000.
Ozawa, Hiroshi; Torii, Yoshinori; Kobayashi, Nobuki; and Ishikawa, Koji, to Mitsui Toatsu Chemicals, Inc. Process for forming metallic finish coatings. 4,142,018, Cl. 428-323.000.
P. R. Mallory & Co., Inc.: *See*—
Sweany, Louis P.; and Burk, Michael T., 4,142,186, Cl. 340-388.000.
Pacifici, James G.: *See*—
Newland, Gordon C.; Pacifici, James G.; and Young, David A., 4,141,808, Cl. 204-159.240.
Padmanabhan, Subramaniam: *See*—
Hasler, Werner; and Padmanabhan, Subramaniam, 4,141,290, Cl. 101-93.480.
Palamidessi, Giorgio: *See*—
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, 4,141,899, Cl. 546-118.000.
Pall Corporation: *See*—
Campolong, Joseph, 4,141,705, Cl. 55-394.000.
Panatrac Manufacturing Corporation Limited: *See*—
Orpana, Robert J., 4,141,600, Cl. 305-36.000.
Pandrol Limited: *See*—
Gragnani, Nelson A., 4,141,500, Cl. 238-304.000.
Panelfold, Inc.: *See*—
Dixon, Guy E., 4,141,106, Cl. 16-89.000.
Panissidi, Hugo A.: *See*—
Herbst, Noel M.; Liu, Chao N.; and Panissidi, Hugo A., 4,142,175, Cl. 340-146.3SY.
Panteleev, Anatoly I.: *See*—
Blagov, Evgeny E.; Panteleev, Anatoly I.; and Dmitriev, Nikolai S., 4,141,289, Cl. 100-212.000.
Panzera, Carlino: *See*—
Erickson, Arnold R.; Panzera, Carlino; and Tolokan, Robert P., 4,142,022, Cl. 428-432.000.
Parnell, Donald R.: *See*—
Luttinger, Manfred; Olszewski, Anthony R.; and Parnell, Donald R., 4,141,877, Cl. 260-37.0EP.
Partridge, Richard L.: *See*—
Bean, Bradford M.; Langston, Keith N.; Partridge, Richard L.; and Sy, Kian-Bon K., 4,142,234, Cl. 364-200.000.
Pass-Port Systems Corporation: *See*—
Brooks, Norman B.; and Olmstead, Michael M., 4,141,458, Cl. 214-301.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,141,863, Cl. 260-3.000.
Coran, Aubert Y.; and Patel, Raman, 4,141,878, Cl. 260-33.6AQ.
Paulin, Leo J. Golf putter. 4,141,556, Cl. 273-164.000.
Pavilcius, Audrone M.; and Latko, Mary Ann, to Nalco Chemical Company. Emulsion breaking. 4,141,854, Cl. 252-301.10W.
Pavlov, Stanislav J.; Stepanova, Valentina A.; Bogdanova, Olga V.; Kuznetsov, Sergei G.; Dorofeeva, Tatyana G.; Bushin, Alexandr N.; Stepanov, Gennady A.; Eratov, Leonid K.; Kirnos, Ariadna B.; Plechev, Boris A.; Kharchenko, Alexei P.; Bildinov, Konstantin N.; Yablonsky, Oleg P.; Orlov, Jury V.; Ivanov, Boris E.; Sobolev, Valerian M.; Korshunov, Mikhail A.; Boikova, Svetlana B.; and Kuzovleva, Rimma G. Separating unequally saturated hydrocarbons with monovalent copper salt solutions in β-methoxypropionitrile. 4,141,925, Cl. 260-681.50C.
Payne, L. L.: *See*—
Treat, Russell T., 4,141,425, Cl. 180-65.0DD.
Pearce, Edgar: *See*—
Kyte, Colin T.; Lewis, Geoffrey J.; Pearce, Edgar; and Hume, Keith, 4,142,009, Cl. 427-297.000.
Pearl Musical Instrument Co.: *See*—
Yanagisawa, Mitsuo, 4,141,272, Cl. 84-421.000.
Peden, John R.; and Santillo, Derek V. I. Power operated chuck. 4,141,564, Cl. 279-4.000.
Peltier, Jean-Paul: *See*—
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.
Pennwalt Corporation: *See*—
Dohany, Julius E., 4,141,873, Cl. 260-29.60F.
Pepe, Joseph P.: *See*—
Olofson, Roy A.; and Pepe, Joseph P., 4,141,897, Cl. 546-45.000.
Perry, Glen D., to Monsanto Company. Layered fabrics and processes for producing same. 4,142,016, Cl. 428-284.000.
Perry, John, to United States of America, Army. Fuel cell anode electrode, method of making the fuel cell anode electrode, and fuel cell containing the fuel cell anode electrode. 4,141,801, Cl. 204-2.100.
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., to UOP Inc. Catalytic reaction chamber for gravity-flowing catalyst particles. 4,141,690, Cl. 422-216.000.
Peterson, David C., to Upjohn Company, The. ω-Aryl-PGD compounds. 4,142,052, Cl. 560-53.000.
Petersson, Bengt O., to Bengt Petersson New Products Investment AB. Apparatus for feeding and processing buttons. 4,141,140, Cl. 29-787.000.
Pfahler, Gerhard: *See*—
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,142,047, Cl. 544-180.000.
Pfistermeister, Martin; Krapf, Heinz; and Coester, Erwin, to URANIT Uran-Isotopentrennungs-Gesellschaft mbH. Process for the formation of an anticorrosive, oxide layer on maraging steels. 4,141,759, Cl. 148-6.350.
Pfizer Inc.: *See*—
Bindra, Jasjit S., 4,141,979, Cl. 424-251.000.
Kuhla, Donald E., 4,141,898, Cl. 546-121.000.
Phelps Dodge Industries, Inc.: *See*—
Sollner, George H.; Bultemeier, Keith D.; and Remaks, Richard D., 4,141,886, Cl. 528-273.000.
Philip Morris Incorporated: *See*—
Teng, Lina C., 4,141,906, Cl. 260-340.50R.
Phillips, Eugene: *See*—
Dugan, William P.; and Phillips, Eugene, 4,141,782, Cl. 156-643.000.
Phillips Petroleum Company: *See*—
Crowley, Ralph P.; and Staples, Max G., 4,141,816, Cl. 208-107.000.
DeFord, Donald D.; and Clardy, Edwin K., 4,141,237, Cl. 73-23.100.
McKay, Dwight L., 4,141,858, Cl. 252-439.000.
Smith, Ernest L., 4,141,463, Cl. 220-359.000.
Phillips, Reginald A.; Eckersley, John; and Hamilton, Terence, to Gullick Dobson Limited. Manipulable tool mount. 4,141,594, Cl. 299-43.000.
Phillips, William, to RCA Corporation. Surface acoustic wave device with reduced spurious responses. 4,142,163, Cl. 333-72.000.
Physics International Company: *See*—
O'Neill, Cormac G., 4,141,675, Cl. 417-214.000.
Piccirillo, David P., to Diamond Power Specialty Corporation. Electrical connecting means. 4,141,614, Cl. 339-17.00F.
Pickar, Kenneth A.; and Wei, John S. S., to Northern Telecom Limited. Optical system for multiple imaging a linear object. 4,141,625, Cl. 350-171.000.
Pickens, George O., to United States of America, Navy. Efficient apparatus for projecting acoustic waves. 4,142,171, Cl. 340-12.00R.
Pieroni, Joseph K.: *See*—
Melvin, Terence; Pieroni, Joseph K.; Martin, Frank S.; and Little, James F., 4,141,559, Cl. 273-220.000.
Pietzsch, Ing. Ludwig: *See*—
Stolz, Hans-Peter, 4,141,599, Cl. 305-35.00R.
Pigasse, Daniel: *See*—
Cabut, Louis A.; Hardouin, Jean-Claude H. R.; Huille, Michel E. A.; and Pigasse, Daniel, 4,141,904, Cl. 260-314.500.
Piljukov, Jury F.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.

Pillsbury, John L.: *See—*
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Pink, Hans: *See—*
Aulich, Hubert; Pink, Hans; and Grabmaier, Josef, 4,141,710, Cl. 65-3.00A.
Pipkin, David J.; and Schaefer, Donald W., to International Business Machines Corporation. Method for applying a viscous fluid to a substrate. 4,142,010, Cl. 427-355.000.
Pirck, Dietrich: *See—*
Fuchs, Gundolf; Humbert, Heiko; and Pirck, Dietrich, 4,141,867, Cl. 260-23.0AR.
Pisani, Federico: *See—*
Garziera, Gastone; and Pisani, Federico, 4,142,244, Cl. 364-900.000.
Pisecky, Jan; and Sorensen, Ib H., to Aktieselskabet Niro Atomizer. Spray drying atomizer wheel. 4,141,783, Cl. 159-4.00S.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., to Mobil Oil Corporation. Novel reforming catalysts. 4,141,859, Cl. 252-455.00Z.
Plasmine Corporation, The: *See—*
Emerson, Ralph W.; and Martin, Jerome L., 4,141,750, Cl. 106-218.000.
Plate Bonn Gesellschaft mit beschrankter Haftung: *See—*
Hoss, Georg; and de Jong, Eduard, 4,141,869, Cl. 260-29.15B.
Plechev, Boris A.: *See—*
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Plempel, Manfred: *See—*
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Plotkowiak, Joseph: *See—*
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PNC Company: *See—*
Keuchel, Herbert W., 4,141,773, Cl. 156-244.150.
Politechnika Slaska im. Wincentego Pstrowskiego: *See—*
Gierek, Adam; Bajka, Lech; and Machnicka, Malgorzata, 4,142,011, Cl. 427-431.000.
Pompei, Francesco, to Foster-Miller Associates, Inc. Internal combustion engine fuel injection system. 4,141,329, Cl. 123-139.00B.
Porter, Herbert L.: *See—*
Wegner, John W.; and Porter, Herbert L., 4,141,378, Cl. 137-315.000.
Porter, Philip: *See—*
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Poulain, Marcel: *See—*
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Poulain, Michel: *See—*
Lucas, Jacques; Poulain, Michel; and Poulain, Marcel, 4,141,741, Cl. 106-47.00Q.
Powell, William R.: *See—*
Fischell, Robert E.; and Powell, William R., 4,141,365, Cl. 128-404.000.
Powers Regulator Co.: *See—*
Duchek, Ernest J., 4,141,496, Cl. 236-49.000.
PPG Industries, Inc.: *See—*
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,141,810, Cl. 204-181.00C.
Nielsen, Donald R., 4,141,930, Cl. 568-864.000.
Reese, Walter J., 4,141,709, Cl. 65-2.000.
Prange, Uwe: *See—*
El-Chahawi, Moustafa; Prange, Uwe; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,141,915, Cl. 260-465.00D.
Precision Monolithics, Inc.: *See—*
Chang, James J. S., 4,142,117, Cl. 307-353.000.
Preiser, Mark E.: *See—*
Hardy, Arthur H., Jr.; and Preiser, Mark E., 4,142,116, Cl. 307-350.000.
Prescott, Roger N.: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,141,296, Cl. 102-24.00R.
Presley, Rex W., to Bendix Corporation, The. Rack and pinion steering device. 4,141,432, Cl. 180-148.000.
Pries, Erich; and Wackerbarth, Folkard, to Dr. C. Otto & Comp. G.m.b.H. Method of operating a battery of coke ovens. 4,141,797, Cl. 201-41.000.
Primark AG: *See—*
Funaro, Giampaolo, 4,141,468, Cl. 222-105.000.
Prior, William L.; and Lindstrom, Richard S., to Arthur D. Little, Inc. Cellular inorganic resin cements, and process and compositions for forming them. 4,141,744, Cl. 106-105.000.
Pritchett, Ervin G., to National Distillers and Chemical Corporation. High impact strength polymer triblends. 4,141,936, Cl. 260-897.00C.
Procter & Gamble Company, The: *See—*
Buell, Kenneth B., 4,141,772, Cl. 156-227.000.
McDanald, Stephen R., 4,141,841, Cl. 252-8.800.
Produits Chimiques Ugine Kuhlmann: *See—*
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Prokofiev, Samuil V.: *See—*
Matveev, Oleg A.; and Prokofiev, Samuil V., 4,141,777, Cl. 156-606.000.
Prosol, Mikhail I. Automatic crustacean trap. 4,141,172, Cl. 43-105.000.
Protecon B.V.: *See—*
Van Bergen, Theodorus, 4,141,113, Cl. 17-1.00G.
Proto, Richard C., to United States of America, Army. Apparatus for generating digital streams having variable probabilities of error. 4,142,239, Cl. 364-717.000.
Proust, Francois O.: *See—*
Clin, Francois H.; Gony, Jean-Noel M.; and Proust, Francois O., 4,141,450, Cl. 209-3.100.
Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 4,141,267, Cl. 83-712.000.
Pryor, Roy R.; and Pryor, Harold A. Sawmill method and apparatus. 4,141,267, Cl. 83-712.000.
Puech, Claude: *See—*
Oprandi, Pierre; Lehureau, Jean-Claude; Puech, Claude; Peltier, Jean-Paul; Le Carvennec, Francois; Lacotte, Jean-Pierre; and Bricot, Claude, 4,142,208, Cl. 358-127.000.
Pullman Incorporated: *See—*
Marsden, Dennis B., 4,141,093, Cl. 5-9.00R.
Marulic, Walter J.; and Ferris, Ray L., 4,141,300, Cl. 105-368.00S.
Pulvari, Charles F. Automated flush system. 4,141,091, Cl. 4-313.000.
PUMA-Sportschuhfabriken Rudolf Dassler KG, Firma: *See—*
Benseler, Hans; and Schaefer, Horst, 4,141,158, Cl. 36-32.00R.
PWA Papierwerke Waldhof-Aschaffenburg Aktiengesellschaft: *See—*
Schadler, Reinhold, 4,141,787, Cl. 162-42.000.
QUAD Corporation: *See—*
deVries, Egbert, 4,141,702, Cl. 55-94.000.
Quaker Oats Company, The: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,141,996, Cl. 426-44.000.
Quarz-Zeit AG: *See—*
Stein, Manfred, 4,142,147, Cl. 324-79.00R.
Queener, Carl A., to International Business Machines Corporation. Mini-collator/sorter. 4,141,546, Cl. 271-173.000.
Quick, Gary K., to King Radio Corporation. Tool for inserting and extracting integrated circuits. 4,141,138, Cl. 29-740.000.
R. E. Phelon Company, Inc.: *See—*
Lemanski, Joseph S., 4,142,077, Cl. 200-19.00A.
R. J. Brown and Associates AG: *See—*
Brown, Robert J., 4,141,667, Cl. 405-161.000.
R. R. Donnelley & Sons, Inc.: *See—*
Michel, Walter A.; and Hagenbart, Donald E., 4,141,492, Cl. 235-437.000.
Raden, Daniel S.; Weiner, Morton A.; and Hill, Douglas W., to Abbott Laboratories. Catalyst combination for polyurethanes. 4,141,862, Cl. 521-129.000.
Radzins, Edmund A., to Curt G. Joa, Inc. Bale loader for fluff generator. 4,141,509, Cl. 241-30.000.
Ramer, James L. Concrete railroad bed. 4,141,499, Cl. 238-25.000.
Ramsey, S. David, Jr.: *See—*
Green, Philip S.; Schaefer, Louis F.; Taenzer, Jon C.; Holzemer, John F.; Ramsey, S. David, Jr.; and Suarez, Joe R., 4,141,347, Cl. 128-2.00V.
Randolph, Ellwood A. Primary flow sensing device. 4,141,246, Cl. 73-194.00B.
Rapp, James E., to Owens-Illinois, Inc. Melt-formed polycrystalline ceramics and dopant hosts containing phosphorus. 4,141,738, Cl. 106-39.600.
Rath, Heinz J.: *See—*
Authier, Bernhard; Rath, Heinz J.; Schmidt, Dietrich; and Hofer, Johann, 4,141,764, Cl. 148-174.000.
Rauenhorst, Gerald A. Hollow-core concrete slabs and the method of making the same. 4,141,946, Cl. 264-69.000.
Rayboy, Eric R. Buoyancy operated Sunmill. 4,141,218, Cl. 60-641.000.
Raymond International, Inc.: *See—*
Engel, David J., 4,141,668, Cl. 405-202.000.
Raytheon Company: *See—*
Israel, Henry M., 4,142,082, Cl. 219-10.55B.
Smith, Irl W.; and Dorschner, Terry A., 4,141,651, Cl. 356-350.000.
RCA Corporation: *See—*
Bloom, Allen, 4,141,627, Cl. 350-349.000.
Carlson, David E.; Wronski, Christopher R.; and Triano, Alfred R., Jr., 4,142,195, Cl. 357-15.000.
Dingwall, Andrew G. F., 4,142,197, Cl. 357-23.000.
Endriz, John G., 4,142,123, Cl. 313-400.000.
Hannan, William J., 4,142,204, Cl. 358-2.000.
Hart, Lewis F., 4,141,456, Cl. 214-1.00R.
Hedlund, Lee V.; Fink, Ronald P.; and Wright, David I., 4,142,209, Cl. 358-128.000.
Kleinknecht, Hans P.; and Kane, James, 4,141,780, Cl. 156-626.000.
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Readio, Philip D.; and Allan, John L. H., to Dart Industries Inc. Dissolution of metals. 4,141,850, Cl. 252-79.400.
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; and Vachhani, Vasantrai A., to AMP Incorporated. Transversely slotted barrel terminal. 4,141,618, Cl. 339-97.00P.
Recaro GmbH & Co.: *See—*
Goldner, Walther; and Wall, Helmut, 4,141,586, Cl. 297-191.000.
Rech, Jakob, to Applefield, Sheldon H.; and Applefield, Jerome, part

interest to each. Valved closure for dispensing container. 4,141,476, Cl. 222-505.000.

Reed, David F., to Hallmark Cards, Incorporated. Jam-resistant lead feed mechanism for mechanical pencil. 4,141,663, Cl. 401-68.000.

Reed, William M.: *See*—
Hayes, Thomas J.; and Reed, William M., 4,141,549, Cl. 273-29.00A.

Reedy, Charles E.; and Carlson, Edwin S., to ACF Industries, Incorporated. Bottom operable tank car valve assembly having shear plane. 4,141,535, Cl. 251-144.000.

Reese, Walter J., to PPG Industries, Inc. Bushing environmental control. 4,141,709, Cl. 65-2.000.

Regal Games Mfg. Co.: *See*—
Spitzner, Erich A., 4,141,561, Cl. 273-271.000.

Regehr, Ulrich. Droplet separator. 4,141,706, Cl. 55-437.000.

Regel, Erik: *See*—
Draber, Wilfried; Plempel, Manfred; Buchel, Karl H.; and Regel, Erik, 4,141,981, Cl. 424-263.000.

Reich, Richard B. Heavy fuel oil nozzle. 4,141,505, Cl. 239-431.000.

Reich, Zygmund: *See*—
Hiscock, Benjamin E.; and Reich, Zygmund, 4,141,161, Cl. 40-547.000.

Reid, Michael G.; and Rowell, Stephen R., to Eastman Kodak Company. Toner concentration monitor. 4,141,645, Cl. 355-3.0DD.

Reiff, Gunther: *See*—
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,142,035, Cl. 528-177.000.

Reiff, Helmut: *See*—
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Reliable Electric Company: *See*—
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Sollner, George H.; Bultemeier, Keith D.; and Remaks, Richard D., 4,141,886, Cl. 528-273.000.

Reme Enterprises, Inc.: *See*—
Ferguson, Andrew M.; Keith, Ernest V.; and Hatchell, David C., 4,141,094, Cl. 5-81.00R.

Remia B.V.: *See*—
te Riele, Johannes H., 4,141,655, Cl. 366-118.000.

Remmers, Gerrit; and Tielemans, Leonardus P. M., to U.S. Philips Corporation. Rotation-insensitive spiral groove bearing. 4,141,603, Cl. 308-9.000.

Renfrew, Edgar E.; and Smith, Roy E., to American Color & Chemical Corporation. Process for preparing p-[[p-(phenylazo)phenyl]azo]-phenol. 4,141,892, Cl. 260-186.000.

Republic Steel Corporation: *See*—
Abraham, John K.; and Vander Arend, Peter J., 4,141,761, Cl. 14°-36.000.

Research Corporation: *See*—
Olofson, Roy A.; and Pepe, Joseph P., 4,141,897, Cl. 546-45.000.

Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: *See*—
Yajima, Seishi; and Hamano, Masaaki, 4,141,726, Cl. 75-229.000.

Reulecke, Wilhelm: *See*—
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Reusser, Raymond E.: *See*—
Hill, David W.; Katz, Lewis E.; Lavigna, Robert J.; and Reusser, Raymond E., 4,141,779, Cl. 156-617.0SP.

Rexnord Inc.: *See*—
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Reyes, Eugene E. Kingpin lock for semi-trailer type travel trailers. 4,141,233, Cl. 70-232.000.

Reynolds, William G., to Trion Industries Inc. Laminated compacted particle aluminum sheet. 4,141,482, Cl. 228-158.000.

Reznikov, Efim A.: *See*—
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.

Rheem Manufacturing Company: *See*—
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Rhodes, Tony: *See*—
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Rhone-Poulenc Industries: *See*—
Kuntz, Emile, 4,142,060, Cl. 568-840.000.

Rhone-Progil: *See*—
Dupuy, Georges; Daumas, Jean-Claude; and Michel, Max, 4,141,962, Cl. 423-571.000.

Ricca, Tom L. Attachment for remote control of a keyboard. 4,141,658, Cl. 400-70.000.

Rich, Rodney W., Jr. Poured floor level indicator. 4,141,310, Cl. 33-293.000.

Richard Heinze, Firma: *See*—
Busse, Peter, 4,141,108, Cl. 16-129.000.

Richard Wolf GmbH: *See*—
Wurster, Helmut, 4,141,362, Cl. 128-303.100.

Richards, Elmer A., to Eaton Corporation. Blocker and jaw clutch assembly. 4,141,440, Cl. 192-53.00F.

Richards Manufacturing Company, Inc.: *See*—
Treace, James T.; and Treace, Dan H., 4,141,088, Cl. 3-1.912.

Richardson, John A.: *See*—
Allen, David W.; Richardson, John A.; and Sutherland, Ian A., 4,141,345, Cl. 128-2.00S.

Richter, George N.: *See*—
Marion, Charles P.; Estabrook, Lawrence E.; and Richter, George N., 4,141,695, Cl. 48-197.00R.
Marion, Charles P.; Estabrook, Lawrence E.; and Richter, George N., 4,141,696, Cl. 48-197.00R.

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Ricoh Company, Ltd.: *See*—
Eda, Tadahiro; Mochizuki, Nobuo; and Nakagawa, Yukihiko, 4,141,643, Cl. 355-3.0DD.
Miyakawa, Seiichi; and Yano, Takashi, 4,142,165, Cl. 355-14.000.
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,141.729, Cl. 96-1.50R.

Rieth, James E. Deep trolling apparatus. 4,141,169, Cl. 43-27.400.

Rijke, Arie; McCoy, Sue; and McLaughlin, Robert E., to University of Virginia Alumni Patents Foundation. Osseous cement composition. 4,141,864, Cl. 260-17.4SG.

Riker Laboratories, Inc.: *See*—
Scherrer, Robert A., 4,141,990, Cl. 424-285.000.

Riordan, Mathew B.; and Lee, Arley G., to Eastman Whipstock, Inc. Bearing. 4,141,605, Cl. 308-26.000.

Rioux, Philip J.: *See*—
Gill, Gerald L., Jr.; and Rioux, Philip J., 4,141,180, Cl. 51-5.00R.

Risse, Willis H.: *See*—
Norton, Wilson L., Jr.; and Risse, Willis H., 4,141,700, Cl. 55-337.000.

Ritchie, David A., to WeatherKing, Inc. Energy recovery system for refrigeration systems. 4,141,222, Cl. 62-179.000.

Ritterman, Paul F., to TRW Inc. Sealed nickel cadmium battery capable of withstanding high rate overdischarge. 4,142,025, Cl. 429-60.000.

RJR Archer, Inc.: *See*—
Kartanson, John M.; and Neel, Robert M., 4,141,373, Cl. 134-21.000.

Robert Bosch GmbH: *See*—
Leiber, Heinz, 4,141,595, Cl. 303-10.000.
Mattes, Gerd, 4,141,629, Cl. 352-27.000.
Schlott, Walter, 4,141,330, Cl. 123-139.0AW.

Roberts, Clyde D., to Telex Corporation, The. Tape drive tester. 4,142,215, Cl. 360-31.000.

Roberts, James K., to Bendix Corporation, The. Shoe hold-down spring for a drum brake. 4,141,437, Cl. 188-340.000.

Roberts, William E., to Addressograph-Multigraph Corporation. Method and apparatus for developing microfilm. 4,141,640, Cl. 354-300.000.

Robertshaw Controls Company: *See*—
Katchka, Jay R.; and Kelly, Samuel T., 4,142,169, Cl. 335-243.000.

Rochman, Zur. Machine for packaging chickens. 4,141,194, Cl. 53-529.000.

Rockwell International Corporation: *See*—
Bake, Earl A.; and Stephens, Leonard J., 4,141,538, Cl. 251-315.000.
Flanagan, Joseph E.; Frankel, Milton B.; and Witucki, Edward F., 4,141,910, Cl. 260-349.000.
Hamilton, C. Howard; and Ascani, Leonard A., 4,141,484, Cl. 228-265.000.
Lo, George A.; and Hamermesh, Charles L., 4,141,768, Cl. 149-19.300.

Rody, Jean: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,141,883, Cl. 260-45.80N.

Roemer, Dietmar: *See*—
Thies, Peter W.; David, Samuel; Hauth, Hartmut; and Roemer, Dietmar, 4,141,988, Cl. 424-278.000.

Rogers, Bryant C., to Diacon Inc. Manufacturing process for package for electronic devices. 4,141,712, Cl. 65-36.000.

Rohm and Haas Company: *See*—
Dunkelberger, David L., 4,141,935, Cl. 260-885.000.
Emmons, William D.; and Nyi, Kayson, 4,141,868, Cl. 260-23.0AR.

Rohr, Bruce E., to General Scanning, Inc. Position detector. 4,142,144, Cl. 324-61.00R.

Rollei-Werke Franke & Heidecke: *See*—
Brendgens, Lothar, 4,141,523, Cl. 248-653.000.

Rolls-Royce (1971) Limited: *See*—
Nightingale, Douglas J., 4,141,501, Cl. 239-265.390.

Romanski, Eric R.; and Josef, Michael J., to Albany International Corporation. Paper machine dryer fabric. 4,141,388, Cl. 139-383.00A.

Roosman, Gosta: *See*—
Otte, Hubert J.; and Roosman, Gosta, 4,142,193, Cl. 354-313.000.

Roper, Stephen J.: *See*—
Kroeger, William C.; and Roper, Stephen J., 4,141,540, Cl. 266-276.000.

Rosch, Gunter: *See*—
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,142,044, Cl. 542-464.000.

Rosenbaum, Heinz J.: *See*—
Thiel, Reinhard; Dietz, Karl-Heinz; Kerres, Hans; Rosenbaum, Heinz J.; and Steiner, Siegfried, 4,141,829, Cl. 210-63.00R.

Rosenkranz, Hans J.: *See*—
Keggenhoff, Berthold; Rosenkranz, Hans J.; and Rudolph, Hans, 4,141,806, Cl. 204-159.220.

Rosinski, Edward J.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,141,859, Cl. 252-455.00Z.
Ross, Phillip T., to General Motors Corporation. Pilot flame tube. 4,141,213, Cl. 60-39.670.
Ross, Svante B.: *See—*
Carnmalm, Bernt S. E.; Lindberg, Ulf H. A.; De Paulis, Tomas; Ross, Svante B.; Stjernstrom, Nils-Erik; Ulff, Carl B. J.; and Ogren, Sven-Ove, 4,141,993, Cl. 424-330.000.
Rotilio, James V. Combination welding torch for shielded inert gas or electric arc welding. 4,142,086, Cl. 219-75.000.
Rowan, Thomas. Trap and drain flush out kit. 4,141,090, Cl. 4-256.000.
Rowe, Neal E.: *See—*
Wilson, John R.; Bharteey, Brij M.; and Rowe, Neal E., 4,142,224, Cl. 361-356.000.
Rowe, Robert. Portable storage apparatus. 4,141,612, Cl. 312-245.000.
Rowell, Stephen R.: *See—*
Reid, Michael G.; and Rowell, Stephen R., 4,141,645, Cl. 355-3.0DD.
Rozengart, Jury I.: *See—*
Untilov, Viktor J.; Kheifets, Robert G.; Rozengart, Jury I.; Ostrenko, Viktor Y.; Reznikov, Efim A.; Sukonnik, Izrail M.; Chichkov, Jury V.; Oleinik, Vladimir I.; Drobich, Oleg P.; Fedorov, Oleg G.; and Morozenko, Vadim N., 4,141,483, Cl. 228-193.000.
Rubin, Harry R. Sighting device for firearms. 4,141,163, Cl. 42-1.00S.
Rucci, Charles D. Device for decreasing heat transfer and slosh from a beverage container. 4,141,462, Cl. 220-254.000.
Rudolph, Hans: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,142,035, Cl. 528-177.000.
Keggenhoff, Berthold; Rosenkranz, Hans J.; and Rudolph, Hans, 4,141,806, Cl. 204-159.220.
Ruetz, Lothar: *See—*
Nassenstein, Heinrich; Menold, Richard; Feld, Fritz; Ellegast, Konrad; Weisbeck, Roland; Gelhaar, Hans G.; Ruetz, Lothar; and Elsasser, Friedrich W., 4,141,315, Cl. 118-420.000.
Rump, Martin, to Dietz Armaturen GmbH. Liquid discharge nozzle with flow divider. 4,141,507, Cl. 239-590.500.
Rumyantsev, Nikolai G.: *See—*
Balandin, Genrikh D.; and Rumyantsev, Nikolai G., 4,142,133, Cl. 315-382.000.
Rupchock, Patricia A.: *See—*
Morris, David A. N.; Rupchock, Patricia A.; and Skarstedt, Mark T., 4,141,688, Cl. 23-230.00B.
Rupert's Certi-Fresh Foods, Inc.: *See—*
Kilpatrick, John S., 4,142,001, Cl. 426-302.000.
Russell, Gordon A.: *See—*
Campbell, George E., Jr.; Nelson, Joseph W.; and Russell, Gordon A., 4,141,387, Cl. 138-158.000.
Russell, Percy. Photographic slide magazine spring assembly. 4,141,631, Cl. 353-116.000.
Russell, Robert C. H., to Secretary of State for Energy, in Her Britannic Majesty's Government of the United Kindgom of Great Britain and Northern Ireland, The. Device for extracting energy from water waves. 4,141,670, Cl. 415-2.000.
Ryan, Edward J., to United Technologies Corporation. Method and apparatus for removing one or more vanes from a gas turbine compressor stator. 4,141,124, Cl. 29-427.000.
Ryan, John W.: *See—*
Beny, Janos; Moore, James D.; and Ryan, John W., 4,141,553, Cl. 273-86.00B.
Ryan, Richard: *See—*
Benes, David M.; Gates, Allan L.; and Ryan, Richard, 4,141,566, Cl. 280-16.000.
S & C Electric Co.: *See—*
Kalvaitis, Arvydas J., 4,142,078, Cl. 200-48.00R.
Saam, Ulrich: *See—*
Berges, Dietrich; Saam, Ulrich; Fuhrer, Robert; and Damzog, Bodo, 4,141,205, Cl. 57-58.320.
Sada, Kenzo: *See—*
Murayama, Yoshinobu; Sada, Kenzo; and Kutomi, Mitsuhiro, 4,141,424, Cl. 180-53.0CD.
St. Clair, David: *See—*
Mueller, Martin; and St. Clair, David, 4,141,195, Cl. 53-412.000.
Saint Gobain Industries: *See—*
Ammannati, Piero; and Coulon, Jean-Claude, 4,141,713, Cl. 65-182.00R.
Saito, Kiyoji, to Nippon Kogaku K.K. Lens barrel for camera. 4,141,639, Cl. 354-289.000.
Saito, Kouji: *See—*
Mizuguchi, Saburo; Nomura, Isao; Naito, Takeyuki; Onodera, Masato; and Saito, Kouji, 4,141,785, Cl. 162-36.000.
Saito, Syunji: *See—*
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Sakamoto, Akiyoshi: *See—*
Ishikawa, Kenkichi; Kumagai, Shinobu; Hasegawa, Teruyuki; and Sakamoto, Akiyoshi, 4,141,249, Cl. 73-423.00R.
Sakuta, Youichi: *See—*
Kato, Akira; Matsuda, Shinpei; Uno, Shigeo; Sakuta, Youichi; Nakajima, Fumito; and Kagabu, Hiroshi, 4,141,959, Cl. 423-239.000.
Sallmann, Alfred: *See—*
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,141,982, Cl. 424-267.000.
Sandoz Ltd.: *See—*
Allan, Zdenek, 4,141,889, Cl. 260-144.000.
Koch, Werner, 4,142,043, Cl. 542-433.000.
Sangamo Weston, Inc.: *See—*
Nador, Julius, 4,142,149, Cl. 324-157.000.
Sankyo Company, Limited: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,141,883, Cl. 260-45.80N.
Sanraku-Ocean Co., Ltd.: *See—*
Nishino, Toyokazu; Hamagishi, Yasutaro; Oki, Toshikazu; and Murao, Sawao, 4,141,972, Cl. 424-180.000.
Santillo, Derek V. I.: *See—*
Peden, John R.; and Santillo, Derek V. I., 4,141,564, Cl. 279-4.000.
Sardina, John F.: *See—*
Hammond, Howard A.; and Sardina, John F., 4,141,257, Cl. 74-529.000.
Sasahara, Yasumasa, to Nippon Gakki Seizo Kabushiki Kaisha. Operating mechanisms of electric devices. 4,141,226, Cl. 64-17.00R.
Sasaki, Isao: *See—*
Kodama, Tsuneo; Sasaki, Isao; and Mori, Hiroshi, 4,141,882, Cl. 260-40.00R.
Sasaki, Masaomi: *See—*
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,141,729, Cl. 96-1.50R.
Sasaki, Naoaki: *See—*
Kawawa, Takao; Imai, Ryoichiro; Tokunaga, Hisami; Nakano, Yutaka; and Sasaki, Naoaki, 4,141,812, Cl. 204-195.00S.
Sasakura Engineering Company, Limited: *See—*
Takada, Masahura, 4,141,410, Cl. 165-113.000.
Sato, Suguru: *See—*
Mori, Kazumasa; and Sato, Suguru, 4,141,613, Cl. 322-28.000.
Sato, Tadashi; Torigai, Akiyoshi; Kasamura, Toshirou; and Tanaka, Hidetoshi, to Canon Kabushiki Kaisha. Corona discharge means in an image formation apparatus. 4,141,644, Cl. 355-3.0CH.
Sato, Takefumi; and Dohi, Yuji, to Sharp Kabushiki Kaisha. Pressure control valve for use in an antilock brake control system. 4,141,597, Cl. 303-119.000.
Satoh, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control system. 4,141,435, Cl. 187-29.00R.
Satomi, Kunio: *See—*
Hasegawa, Tetsuo; Touma, Hitoshi; Satomi, Kunio; and Miyamae, Tatsuo, 4,141,849, Cl. 252-62.10P.
Saunders, John C.; and Williamson, William R. N., to Lilly Industries Limited. Ketone derivatives. 4,141,995, Cl. 424-331.000.
Scaros, Mike G.: *See—*
Dryden, Hugh L., Jr.; Scaros, Mike G.; and Westrich, John P., 4,141,920, Cl. 260-607.00B.
Scarponi, Ugo: *See—*
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, 4,141,899, Cl. 546-118.000.
Scarsella, Edward L.: *See—*
Spotholz, Clifford H.; Scarsella, Edward L.; and Yadlowsky, Slawko, 4,142,002, Cl. 426-595.000.
Schadler, Reinhold, to PWA Papierwerke Waldhof-Aschaffenburg Aktiengesellschaft. Process for preparing chemical cellulose according to the sulfite process by increasing the total SO_2 content of cooking acid with liquid SO_2 and digesting wood chips. 4,141,787, Cl. 162-42.000.
Schaefer, Donald W.: *See—*
Pipkin, David J.; and Schaefer, Donald W., 4,142,010, Cl. 427-355.000.
Schaefer, Horst: *See—*
Benseler, Hans; and Schaefer, Horst, 4,141,158, Cl. 36-32.00R.
Schaefer, Louis F.: *See—*
Green, Philip S.; Schaefer, Louis F.; Taenzer, Jon C.; Holzemer, John F.; Ramsey, S. David, Jr.; and Suarez, Joe R., 4,141,347, Cl. 128-2.00V.
Schael, Wilfried; Sigdell, Jan-Erik; and Krick, Gerd E., to Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG Apparatebau KG. Apparatus for the mass transfer between two media. 4,141,835, Cl. 210-321.00A.
Schael, Wilfried, to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG. Apparatebau. Dialyser cartridge and method for its manufacture. 4,141,836, Cl. 210-321.00A.
Schenk, Kurt, to Maschinenfabrik Benninger AG. Apparatus for controlling the movements of a reed carriage during warping. 4,141,120, Cl. 28-185.000.
Scherrer, Robert A., to Riker Laboratories, Inc. Anti-microbial alkyl substituted-2-nitro-3-phenylbenzofurans. 4,141,990, Cl. 424-285.000.
Schiffman, Murray M., to MBI, Inc. Method and apparatus for producing evident permanent surface markings on a glazed surface. 4,141,145, Cl. 33-25.00R.
Schildcrout, Sigmund A.: *See—*
Greene, James M.; Schildcrout, Sigmund A.; and Zintgraff, Gary D., 4,142,059, Cl. 562-606.000.
Schilling, Berthold. Dialysis membrane, especially for hemodialysis, and method for producing same. 4,141,838, Cl. 210-498.000.
Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Pattern mechanism for a flat bed knitting machine. 4,141,228, Cl. 66-75.100.
Schinzel, Erich: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,142,044, Cl. 542-464.000.

Schlapfer, Alex R., heir: *See*—
Schlapfer, Hans, deceased; and Schlapfer, Alex R., heir, 4,141,900, Cl. 260-308.00A.
Schlapfer, Hans, deceased (by Schlapfer, Nelly, legal representative); and Schlapfer, Alex R., heir, to Ciba-Geigy Corporation. 3-Phenyl-7-(v-triazol-2-yl)-coumarins. 4,141,900, Cl. 260-308.00A.
Schlapfer, Nelly, legal representative: *See*—
Schlapfer, Hans, deceased; and Schlapfer, Alex R., heir, 4,141,900, Cl. 260-308.00A.
Schlick, Horst, to VDO Adolf Schindling AG. Optical warning indicator means on bimetal measuring element. 4,141,247, Cl. 73-363.500.
Schlott, Walter, to Robert Bosch GmbH. Pressure regulating valve for fuel injection systems. 4,141,330, Cl. 123-139.0AW.
Schlumberger Technology Corporation: *See*—
Nutter, Benjamin P., 4,141,418, Cl. 166-324.000.
Schmauch, Hans-Joachim: *See*—
Breuer, Wolfram; Becker, Wolf-Jurgen; Deprez, Jacques; Drope, Eckard; and Schmauch, Hans-Joachim, 4,141,800, Cl. 204-1.00T.
Schmidt, Adolf: *See*—
Wingler, Frank; Schmidt, Adolf; Liebig, Lothar; and Wassmuth, Gerd, 4,141,934, Cl. 260-881.000.
Schmidt, Charles J. Chuck assembly for a veneer lathe. 4,141,397, Cl. 144-209.00R.
Schmidt, Dietrich: *See*—
Authier, Bernhard; Rath, Heinz J.; Schmidt, Dietrich; and Hofer, Johann, 4,141,764, Cl. 148-174.000.
Schmidt, Frederick L.: *See*—
Zettler, William D.; Woytych, Edward F.; Seichter, Daniel J.; and Schmidt, Frederick L., 4,141,134, Cl. 29-568.000.
Schnall, Gunther; Aldenhoven, Klaus; and Blochl, Hanns, to AGFA-Gevaert AG. Paper feed for copying machine. 4,141,545, Cl. 271-118.000.
Schnall, Gunther; and Blochl, Hanns, to AGFA-Gevaert AG. Optical projection system for copying apparatus. 4,141,649, Cl. 355-51.000.
Schneider, Abraham; and Myers, Harry K., Jr., to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with an acrylic acid ester. 4,142,055, Cl. 560-116.000.
Schneider, Jean C. Headrest for seat of vehicle. 4,141,589, Cl. 297-397.000.
Schnell, William J.: *See*—
Bellotti, Marc; and Schnell, William J., 4,141,834, Cl. 210-241.000.
Schoenfield, Palmer J.: *See*—
Barlow, Gordon A.; and Schoenfield, Palmer J., 4,141,175, Cl. 46-103.000.
Schonwald, Siegfried, to Siemens Aktiengesellschaft. Impeller for a ring compressor. 4,141,674, Cl. 416-223.00A.
Schoofs, Richard J. Adsorbent for use in double glazed windows. 4,141,186, Cl. 52-172.000.
Schora, Frank C.; and Janka, John C., to Institute of Gas Technology. Enhanced oil recovery. 4,141,417, Cl. 166-305.00R.
Schrader, Robert W.; and Carroll, John F., Jr., to Eastman Kodak Company. Process for reducing core-set curling tendency and core-set curl of polymeric film elements. 4,141,735, Cl. 96-75.000.
Schrecongost, Ray B., to Hammond Corporation. Modulated keyer supply sampling circuit. 4,141,270, Cl. 84-1.240.
Schroder, Martin: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,142,013, Cl. 428-36.000.
Schroll, Gene E., to Cincinnati Milacron Inc. Epoxy resin compositions containing an amine-cyanic acid ester combination curing agent. 4,142,034, Cl. 528-120.000.
Schuller, Hans: *See*—
Szabolcs, Otto; and Schuller, Hans, 4,141,957, Cl. 422-135.000.
Schulte, Klaus; and Ersfeld, Heinrich, to Bayer Aktiengesellschaft. Mixing head for mixing at least two reactive components. 4,141,470, Cl. 222-137.000.
Schultz, Timothy R. Gun safety device. 4,141,166, Cl. 42-70.00B.
Schultze, Jorge. Expandable endotracheal or urethral tube. 4,141,364, Cl. 128-349.00B.
Schumann, Robert W.; and Wells, Gary L., to Nicolet Instrument Corporation. Digital apparatus for waveform measurement. 4,142,146, Cl. 324-77.00A.
Schwab, William B.: *See*—
Alger, Donald L.; Schwab, William B.; and Furman, Edward R., 4,141,224, Cl. 62-514.00R.
Schwartz, John G., Jr.: *See*—
Lunde, James M.; and Schwartz, John G., Jr., 4,141,439, Cl. 192-18.00R.
Schwartzman, Sanford; and Lima, Daniel A., to American Carbonyl, Inc. Method of generating lower alkyl and cycloalkyl isocyanates. 4,141,913, Cl. 260-453.00P.
Schwarz, Hans-Helmut: *See*—
Immel, Otto; de Jager, Andre; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,141,896, Cl. 260-239.30A.
Schweiger, Richard G. Cellulose sulfate esters. 4,141,746, Cl. 106-169.000.
Schweikle, George E.: *See*—
Diersing, Raymond A.; Hackenbroch, Wilhelm T.; Schweikle, George E.; and Stanback, Harris I., 4,142,225, Cl. 361-358.000.
Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. Benzo[g]pyrido[2,1-b]quinazolinones. 4,142,049, Cl. 544-246.000.
SCM Corporation: *See*—
Becker, Edmund H.; and Lindstrom, Robert O., 4,141,287, Cl. 99-450.100.
Scott, Gary M. Handle bar hand guards. 4,141,567, Cl. 280-289.00G.
Scott, Jimmie D.; and Weldon, William F., to Spencer Wright Industries, Inc. Rotary knife module for tufting machines. 4,141,303, Cl. 112-79.00R.
Scott, Marion L.; and Lakin, Kenneth M., to United States of America, Navy. Two-dimensional surface acoustic wave image scanning. 4,142,212, Cl. 358-213.000.
Scott, Ronald K., to Caterpillar Tractor Co. Apparatus for dynamically timing a diesel engine. 4,141,242, Cl. 73-117.300.
Secretary of State for Energy, in Her Britannic Majesty's Government of the United Kindgom of Great Britain and Northern Ireland, The: *See*—
Russell, Robert C. H., 4,141,670, Cl. 415-2.000.
Sedlmeier, Josef: *See*—
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Seibu Polymer Kasei Kabushiki Kaisha: *See*—
Nakajima, Nobuyuki, 4,141,742, Cl. 106-47.00R.
Seichter, Daniel J.: *See*—
Zettler, William D.; Woytych, Edward F.; Seichter, Daniel J.; and Schmidt, Frederick L., 4,141,134, Cl. 29-568.000.
Seiichi Awano and Yasui Sangyo Co., Ltd.: *See*—
Awano, Seiichi; and Nishimura, Matsuo, 4,141,343, Cl. 126-360.00A.
Seismograph Service Corporation: *See*—
Baird, George C., 4,141,431, Cl. 181-118.000.
Sejpal, Vasant D., to American Home Products Corporation. Non-aerosol vegetable oil compositions containing lecithin and pure ethyl alcohol. 4,142,003, Cl. 426-601.000.
Seki, Shigeo: *See*—
Niwa, Tomizo; Nojiri, Chuhei; Goi, Hitoshi; Miyado, Shinji; Kai, Fumio; Seki, Shigeo; Yamada, Yujiro; and Niida, Taro, 4,141,790, Cl. 195-29.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Matsuda, Hisayuki; Takahashi, Minoru; Shinoda, Katsuro; Kikyotani, Sho; and Inagaki, Hiroshi, 4,141,888, Cl. 260-123.700.
Sellwood, Raymond E., to M.L. Aviation Company Limited. Ignition circuits. 4,141,297, Cl. 102-206.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Cleaning and lubricating foil cutter. 4,141,265, Cl. 83-169.000.
Sergeev, Oleg A.: *See*—
Kalnin, Igor M.; Krotkov, Vladimir N.; Sutyrina, Taisia M.; Sergeeva, Anna N.; and Sergeev, Oleg A., 4,141,411, Cl. 165-151.000.
Sergeeva, Anna N.: *See*—
Kalnin, Igor M.; Krotkov, Vladimir N.; Sutyrina, Taisia M.; Sergeeva, Anna N.; and Sergeev, Oleg A., 4,141,411, Cl. 165-151.000.
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. 2-Acyl-4-oxo-pyrazino-isoquinoline derivatives and process for the preparation thereof. 4,141,978, Cl. 424-250.000.
Seufert, Arnold. Process and apparatus for the production of sterile filtered blood clotting factors. 4,141,887, Cl. 260-112.00B.
Shabalina, Roza I.: *See*—
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.
Shaffer, Robert W.: *See*—
Weaver, H. William; and Shaffer, Robert W., 4,141,677, Cl. 418-6.000.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Isomorphic copolyoxalates and sutures thereof. 4,141,087, Cl. 3-1.000.
Shalaty, John H., to TRW Inc. Valve rotator. 4,141,325, Cl. 123-90.300.
Sharp Kabushiki Kaisha: *See*—
Hibino, Shinichi; Miyazaki, Takaaki; and Nakayama, Keiji, 4,141,853, Cl. 252-299.000.
Sato, Takefumi; and Dohi, Yuji, 4,141,597, Cl. 303-119.000.
Sharpe, L. Harold, to Stanly Knitting Mills, Inc. Knit cap with elastic head band. 4,141,229, Cl. 66-171.000.
Shaw, David G., to General Electric Company. Capacitor with a stabilized non halogenated impregnant. 4,142,223, Cl. 361-319.000.
Sheary, George W., III: *See*—
Morris, Wilford V.; and Sheary, George W., III, 4,141,159, Cl. 37-58.000.
Sheffer, Ralph L.: *See*—
Beijer, Gene; Smith, James S.; and Sheffer, Ralph L., 4,141,520, Cl. 244-83.00A.
Sheiman, Julius: *See*—
Sheiman, Samuel R.; and Sheiman, Julius, 4,141,107, Cl. 16-128.00R.
Sheiman, Samuel R.; and Sheiman, Julius, to Crest Lock Company. Hinge clip. 4,141,107, Cl. 16-128.00R.
Shell Oil Company: *See*—
Hansen, David R., 4,141,876, Cl. 260-33.6UA.
Kiovsky, Thomas E., 4,141,847, Cl. 252-51.50A.
Sherwin, Donald D. Arrow shaft socket. 4,141,554, Cl. 273-106.50R.
Shida, Sankichi; Okuma, Shinji; Oita, Mashiro; and Hirohata, Hyogo, to Matsushita Electric Industrial Co., Ltd. Electrical contact material and method of making the same. 4,141,727, Cl. 75-232.000.
Shields, Michael P. Adjustable ski strap. 4,141,565, Cl. 280-11.37A.
Shigetomi, Sadao, to Olympus Optical Company Limited. Reaction tube assembly for automatic analyzer. 4,141,954, Cl. 422-64.000.

Shih, Arnold: *See—*
Haas, George A.; Shih, Arnold; and Thomas, Richard E., 4,142,145, Cl. 324-62.000.
Shimada, Saburo, to Sumitomo Rubber Industries, Ltd. Bolt-seating plug. 4,141,190, Cl. 52-711.000.
Shimojima, Masatoshi, to Vivitar Corporation. Zoom lens with movable diaphragm. 4,141,636, Cl. 354-196.000.
Shimp, David A.; and Mitzel, Robert B., to Celanese Polymer Specialties Company. Aqueous dispersions of polyhydroxy polyether resins as coating compositions for metallic substrates. 4,141,871, Cl. 260-29.40R.
Shin-Etsu Chemical Co., Ltd.: *See—*
Ariga, Kinji; and Gomyo, Shiro, 4,141,926, Cl. 260-824.0EP.
Shinko Electric Co., Ltd.: *See—*
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Shinoda, Katsuro: *See—*
Matsuda, Hisayuki; Takahashi, Minoru; Shinoda, Katsuro; Kikyotani, Sho; and Inagaki, Hiroshi, 4,141,888, Cl. 260-123.700.
Shinoda, Masayuki, to Nippon Colin Co., Ltd. Vascular sound detector. 4,141,350, Cl. 128-2.05S.
Shionogi & Co., Ltd.: *See—*
Hirai, Kentato; Fujishita, Toshio; Ishiba, Teruyuki; and Sugimoto, Hiroshiko, 4,141,901, Cl. 260-308.00R.
Shipko, Frederick J., to Coratomic, Inc. Organ-stimulating apparatus and insulating set screw for such apparatus. 4,141,752, Cl. 128-419.00P.
Shono, Tetsuji: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,141,633, Cl. 354-24.000.
Shupp, Jack K.: *See—*
Abel, Eugene K.; and Shupp, Jack K., 4,141,279, Cl. 90-11.00C.
Siegmund, Walter P., to American Optical Corporation. Dynamic image enhancement for fiberscopes. 4,141,624, Cl. 350-96.260.
Siegwart, Emil. Flexible corrugated tube. 4,141,385, Cl. 138-122.000.
Siemens Aktiengesellschaft: *See—*
Aulich, Hubert; Pink, Hans; and Grabmaier, Josef, 4,141,710, Cl. 65-3.00A.
Bitsch, Rainer; and Marin, Heiner, 4,142,081, Cl. 200-251.000.
Druminski, Manfred; and Gessner, Roland, 4,141,765, Cl. 148-175.000.
Knauer, Karl, 4,142,109, Cl. 307-221.00D.
Kotschy, Josef; and Voelkl, Walter, 4,142,222, Cl. 361-273.000.
Schonwald, Siegfried, 4,141,674, Cl. 416-223.00A.
Tannhauser, Armin, 4,142,065, Cl. 178-69.100.
Wiesner, Wolfgang, 4,142,140, Cl. 318-696.000.
Sigdell, Jan-Erik: *See—*
Schael, Wilfried; Sigdell, Jan-Erik; and Krick, Gerd E., 4,141,835, Cl. 210-321.00A.
Sih, Charles J., to Wisconsin Alumni Research Foundation. Prostaglandins and methods for preparing same. 4,142,056, Cl. 560-121.000.
Simi, Victor M.; and Soderman, Donald A., to International Business Machines Corporation. Bucket brigade device and process. 4,142,199, Cl. 357-24.000.
Simmonds Precision Products, Inc.: *See—*
Hiscock, Benjamin E.; and Reich, Zygmund, 4,141,161, Cl. 40-547.000.
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Sittig, Roland; and DeBruyne, Patrick, to BBC Brown, Boveri & Company. Light-controlled thyristor with anode-base surface firing. 4,142,201, Cl. 357-38.000.
Skarstedt, Mark T.: *See—*
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SKF Industrial Trading and Development Company: *See—*
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SKF Kugellagerfabriken GmbH: *See—*
Munnich, Hermann, 4,141,181, Cl. 51-168.000.
SKF Nova AB: *See—*
Nilsson, Sven W., 4,141,255, Cl. 74-25.000.
Slaats, Mathew A.; Welsh, Alan B.; and Bray, Wade R., to Kimball International, Inc. Search mount for telescope and method of operation. 4,142,139, Cl. 318-603.000.
Slemmons, Arthur J.: *See—*
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Smargiassi, Paul R., to Bourns, Inc. Respirator system and method. 4,141,356, Cl. 128-145.800.
Smelyansky, Matvei Y., deceased: *See—*
Frolov, Jury F.; Piljukov, Jury F.; Cherednichenko, Vladimir S.; Orlov, Gennady I.; Kurapin, Igor N.; Shabalina, Roza I.; Lakernik, Mark M.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Elkina, Alla K.; Golovachev, Anatoly I.; Egorova, Tatyana S.; Vlasov, Jury M.; Smelyansky, Matvei Y., deceased; and Zelichenko, Faina S., administrator, 4,141,721, Cl. 75-14.000.
Smit, Gerard C., to Smitdesign B.V. Throughflow heater for coffee making apparatus. 4,141,286, Cl. 99-285.000.
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Smit, Gerard C., 4,141,286, Cl. 99-285.000.
Smith, Arthur. Material reduction means for pumps. 4,141,510, Cl. 241-46.00A.
Smith, Carl K., to Midcon Pipeline Equipment Co. Tangentially fed upflow sand filter method and apparatus. 4,141,824, Cl. 210-17.000.
Smith, Clyde D. Remote operated wrench. 4,141,262, Cl. 81-57.390.
Smith, Ernest L., to Phillips Petroleum Company. Hermetically sealed container. 4,141,463, Cl. 220-359.000.
Smith, Gerald L.: *See—*
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Smith, Irl W.; and Dorschner, Terry A., to Raytheon Company. Laser gyroscope output optics structure. 4,141,651, Cl. 356-350.000.
Smith, James S.: *See—*
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Smith, James W., to United States of America, Agriculture. Quantitative apparatus for sampling athropods associated with field crops. 4,141,174, Cl. 43-139.000.
Smith, Kenneth C.; and Garrett, Michael E., to British Oxygen Company Limited, The. Treatment of waste water. 4,141,823, Cl. 210-17.000.
Smith, Larry B., to Sperry Rand Corporation. Tachometer for measuring speed and direction of shaft rotation with a single sensing element. 4,142,153, Cl. 324-165.000.
Smith, Leslie H., to Imperial Chemical Industries Limited. 1-Aryloxy-3-thenamidoalkylamino-2-propanol derivatives. 4,141,987, Cl. 424-275.000.
Smith, Lester W. Water lifting system. 4,141,391, Cl. 141-59.000.
Smith, Millard S.: *See—*
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Smith, Roy E.: *See—*
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Berges, David A., 4,142,046, Cl. 544-26.000.
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Snapp, Edward A., Jr. Lockable joint for articulated members. 4,141,665, Cl. 403-100.000.
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Snyder, Harold I., to Snyder Manufacturing Co., Incorporated. Evacuator. 4,141,361, Cl. 128-278.000.
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Snyder, Harold I., 4,141,361, Cl. 128-278.000.
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Societa' Farmaceutici Italia S.p.A.: *See—*
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; Luini, Fulvio; Palamidessi, Giorgio; and Scarponi, Ugo, 4,141,899, Cl. 546-118.000.
Societe Anonyme DBA: *See—*
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Societe Anonyme dite: Les Cables de Lyon: *See—*
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Societe Chimique des Charbonnages CdF Chimie: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
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Sola Basic Industries, Inc.: *See—*
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Sollner, George H.; Bultemeier, Keith D.; and Remaks, Richard D., to Phelps Dodge Industries, Inc. Essentially linear polymer having a plurality of amide, imide, and ester groups therein and a method of making the same. 4,141,886, Cl. 528-273.000.
Soma, Ikuo; Magome, Tamotu; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Electrophotography apparatus with downtime control circuitry. 4,141,646, Cl. 355-10.000.
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody,

Jean, to Sankyo Company, Limited; and Ciba-Geigy Corporation. Stabilization of synthetic polymers by penta-or-hexa-substituted 4-piperidinol derivatives. 4,141,883, Cl. 260-45.80N.
Sone, Yukiko: *See—*
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Soothill, John F.; and Levinsky, Roland J., to National Research Development Corporation. Assay of immune complexes. 4,141,965, Cl. 424-12.000.
Sorensen, Ib H.: *See—*
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Sorensen, Ronald L., to Monroe Auto Equipment Company. Vehicle leveling strut. 4,141,572, Cl. 280-707.000.
Spakman, Geert, to U.S. Philips Corporation. Pushbutton reselection tuner with pivoting lever. 4,141,254, Cl. 74-10.330.
Specialty Manufacturing Company: *See—*
Anderson, Arthur A., 4,141,504, Cl. 239-394.000.
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Spicer, Randall O. Bi-directional dump truck. 4,141,591, Cl. 298-17.600.
Spindt, Charles A., to SRI International. Method of fabricating a funnel-shaped miniature electrode for use as a field ionization source. 4,141,405, Cl. 164-46.000.
Spitzer, Joseph G.; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C. Aerosol container with gas-permeable membrane. 4,141,472, Cl. 222-189.000.
Spitzner, Erich A., to Regal Games Mfg. Co. Game card assembly. 4,141,561, Cl. 273-271.000.
Spotholz, Clifford H.; Scarsella, Edward L.; and Yadlowsky, Slawko, to General Foods Corporation. Method for producing a brewable roasted coffee and wheat product. 4,142,002, Cl. 426-595.000.
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Standard Oil Company (Ohio): *See—*
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Stanistreet, Harold P.; and Jowitt, Peter F., to Imperial Chemical Industries Limited; and Jowitt, Peter Frederick. Fire protection means comprising a non-woven fibrous structure of thermally bonded conjugate fibers. 4,141,460, Cl. 220-88.00A.
Stanly Knitting Mills, Inc.: *See—*
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Stedman, Robert N., to Caterpillar Tractor Co. Track shoe with retaining flanges. 4,141,601, Cl. 305-54.000.
Steen, Bengt, to Institutet for Vatten- och Luftvardsforskning. Method for the determination of the amount of particles in gaseous media and a sampling device for performing the method. 4,141,238, Cl. 73-28.000.
Stein, Manfred, to Quarz-Zeit AG. Method and system for testing the accuracy of an electronic clock. 4,142,147, Cl. 324-79.00R.
Steiner, Siegfried: *See—*
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Stockel, Richard F.: *See—*
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Stolz, Hans-Peter, to Pietzsch, Ing. Ludwig. Endless track. 4,141,599, Cl. 305-35.00R.
Stone, Orison W. Recloseable pilfer-proof container and blanks. 4,141,449, Cl. 206-621.000.
Stone & Webster Engineering Corporation: *See—*
Conger, Franklin E., 4,141,825, Cl. 210-23.00H.
Stoops, Reginald B.; and Maxel, John M., to Armco Inc. Unidirectional sheet molding composition and process of preparing same. 4,141,929, Cl. 260-862.000.
Stopinc Aktiengesellschaft: *See—*
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Stover, Harris A., to United States of America, Army. Time reference distribution technique. 4,142,069, Cl. 179-15.0BS.
Strande, Carl S., to Dow Chemical Company, The. Alleviation of minimal brain dysfunction with 2-[(3,4-dichlorophenoxy)methyl]-2-imidazoline. 4,141,985, Cl. 424-273.00R.
Strausfeld, Hermann, to EMI Electrola Gesellschaft mit beschrankter Haftung. Disc record press. 4,141,531, Cl. 249-80.000.
Streeter, Erwin C. Multi-purpose tail gate. 4,141,582, Cl. 296-50.000.
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Sudmeier, James L. Adjustable connection between ski and binding. 4,141,570, Cl. 280-607.000.
Sudweeks, Walter B.; and Jessop, Harvey A., to IRECO Chemicals. Emulsion blasting agent. 4,141,767, Cl. 149-2.000.
Suga, Shigeru. Control means for controlling the position of an electrode in a carbon arc lamp. 4,142,127, Cl. 314-105.000.
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Sullivan, Richard F., to Chevron Research Company. Process for upgrading arsenic-containing oils. 4,141,820, Cl. 208-251.00H.
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Sun, Yun C., to Dow Chemical Company, The. Three phase crystallization. 4,141,924, Cl. 260-674.00R.
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Sundermann, Rudolf: *See*—
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Suzuki, Seigo, to Tokyo Shibaura Electric Co., Ltd. Refreshing system for dynamic memory. 4,142,233, Cl. 364-200.000.
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Sweany, Louis P.; and Burk, Michael T., to P. R. Mallory & Co., Inc. Means for improving the electroacoustical properties of a buzzer. 4,142,186, Cl. 340-388.000.
Sweet, Roger H.: *See*—
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Syroka, Edward C.; and Syroka, Bernice A. Multi-compartment coffee steeping bag and support clip therefor. 4,141,997, Cl. 426-79.000.
Szabolcs, Otto; and Schuller, Hans, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Apparatus for producing polymers of high molecular weight by the two-phase interfacial method. 4,141,957, Cl. 422-135.000.
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, to Tokyo Electric Co., Ltd. Electronic cash register. 4,142,235, Cl. 364-405.000.
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Takai, Kiyoshi; Yamamoto, Naraharu; and Yamamoto, Seiichi, to Osaka Iron & Steel Co., Ltd. Method of treating ferruginous slags. 4,141,722, Cl. 75-24.000.
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Takeshita, Hiroshi; and Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake control assembly responsive to vehicular deceleration. 4,141,596, Cl. 303-24.00C.
Takeuchi, Takeshi; and Terasawa, Takao, to Hochiki Corporation. Casing for electrical equipment. 4,141,615, Cl. 339-36.000.
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Tanaka, Akio, to Zenith Radio Corporation. Tuning system equalized with the slope factor of the tuning curve. 4,142,157, Cl. 325-464.000.
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Tandy Brands, Inc.: *See*—
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Tannenberger, Helmut: *See*—
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Tannhauser, Armin, to Siemens Aktiengesellschaft. Method for bit-synchronous transmission of data. 4,142,065, Cl. 178-69.100.
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Tarrson, Emanuel B.; and Tisma, Stevan, to John O. Butler Company. Thread storage and dispensing system. 4,141,519, Cl. 242-137.100.
Tarsoly, Balazs K. Tool gas turbine motor. 4,141,671, Cl. 415-72.000.
Tatano, Toshio: *See*—
Hayashi, Hiroaki; Watanabe, Katsuyuki; and Tatano, Toshio, 4,141,792, Cl. 195-99.000.
Tatro, Henry J.: *See*—
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Taylor, Joyce A.: *See*—
Hale, Harry O.; and Taylor, Joyce A., 4,141,096, Cl. 5-108.000.
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Forrest, Gordon C.; Jay, Ronald F.; and Clements, John A., 4,141,687, Cl. 23-230.00R.
Technology Application Services Corporation: *See*—
Camacho, Salvador L., 4,141,694, Cl. 48-61.000.
Teepak, Inc.: *See*—
O'Brien, Merrill N., Jr., 4,141,749, Cl. 106-164.000.
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Odenthal, Conrad J., 4,142,128, Cl. 315-15.000.
Teledyne Penn-Union: *See*—
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Lundberg, Nils E. B., 4,142,113, Cl. 307-270.000.
Teletype Corporation: *See*—
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Telex Corporation, The: *See*—
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Teng, Lina C., to Philip Morris Incorporated. Smoking composition and compounds therefor. 4,141,906, Cl. 260-340.50R.
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Goss, Stanley B.; Nagel, Martin J.; and Nilssen, Ole K., 4,142,216, Cl. 360-72.000.
Terasawa, Takao: *See*—
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te Riele, Johannes H., to Remia B.V. Process for homogenizing masses and apparatus for use therein. 4,141,655, Cl. 366-118.000.
Texaco Development Corp.: *See*—
Waddill, Harold G., 4,141,885, Cl. 528-93.000.
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Graham, William J., 4,141,536, Cl. 251-161.000.
Marion, Charles P.; Estabrook, Lawrence E.; and Richter, George N., 4,141,695, Cl. 48-197.00R.
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Mayer, Edward A., 4,141,393, Cl. 141-206.000.
Walker, Thad O.; and Warren, Kenneth W., 4,141,840, Cl. 252-8.50C.
Wu, Ching H.; Brown, Alfred; Konopnicki, Daniel T.; and Allen, Joseph C., 4,141,415, Cl. 166-252.000.
Yaffe, Roberta, 4,141,844, Cl. 252-46.700.
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Texas Instruments Incorporated: *See*—
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Burson, David C., 4,142,180, Cl. 340-709.000.
Marcoux, Leo; and Berg, Peter G., 4,141,327, Cl. 123-122.00F.

McCormack, Kent; and Knight, William M., Jr., 4,142,207, Cl. 358-113.000.
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Thellufsen, Jorn; and Nielsen, Niels E. M., to GNT Automatic A/S. Tape punching device. 4,141,491, Cl. 234-115.000.

Thiel, Reinhard; Dietz, Karl-Heinz; Kerres, Hans; Rosenbaum, Heinz J.; and Steiner, Siegfried, to Bayer Aktiengesellschaft. Process for wet oxidation of organic substances. 4,141,829, Cl. 210-63.00R.

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Thies, Peter W.; David, Samuel; Hauth, Hartmut; and Roemer, Dietmar, to Kali-Chemie Pharma GmbH. 2,9-Dioxatricyclo[4,3,1,$0^{3,7}$]-decane derivatives, processes for their preparation and pharmaceutical compositions thereof. 4,141,988, Cl. 424-278.000.

Thiokol Corporation: *See*—
Thompson, Arnold R., 4,141,950, Cl. 264-138.000.

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Thomas, Herbert: *See*—
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Thomsen, Jack W., to Weckessar Company, Inc. Strain relief bushing. 4,142,064, Cl. 174-153.00G.

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Timex Corporation: *See*—
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Tipton, Larry J.; and Bryant, Steven D., to ACF Industries, Incorporated. Motor driven rotary fuel pump. 4,141,328, Cl. 123-138.000.

Tisma, Stevan: *See*—
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Tobin, Harvey A. Truck box liner. 4,141,581, Cl. 296-39.00R.

Tokunaga, Hisami: *See*—
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Tokyo Electric Co., Ltd.: *See*—
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Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Menju, Shiniti; and Ohshima, Iwao, 4,142,230, Cl. 363-51.000.

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Tomoda, Masayasu: *See*—
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Tonnessen, Arne, to Moss Rosenberg Verft a.s. Insulated tanks for liquefied gases. 4,141,465, Cl. 220-445.000.

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Torigai, Akiyoshi: *See*—
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Wyler, Leopold S., 4,141,332, Cl. 123-148.00R.

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Treytl, William J.; Slemmons, Arthur J.; and Andeen, Gerry B., to FMC Corporation. Method of and apparatus for collecting solar radiation utilizing variable curvature cylindrical reflectors. 4,141,626, Cl. 350-295.000.

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Tykwinski, Leonard M. Knee crutch-cane. 4,141,375, Cl. 135-66.000.

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Ueda, Hiroshi: *See*—
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Union Carbide Corporation: *See—*
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D'Angelo, Paul F., 4,142,032, Cl. 526-43.000.
Faust, Clifford C.; and Mettler, Mark F., 4,141,487, Cl. 229-43.000.
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Agriculture: *See—*
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Smith, James W., 4,141,174, Cl. 43-139.000.
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Appleberry, Walter T. Sequencing device utilizing planetary gear set. 4,141,259, Cl. 74-674.000.
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United States Steel Corporation: *See—*
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van der Lely, Cornelis. Rotary harrows. 4,141,420, Cl. 172-59.000.
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Van Tassel, Norman L.; and Lang, Vladimir, to Bacharach Instrument Company, a division of AMBAC Industries, Inc. Apparatus for testing the volumetric output of fuel injector system components. 4,141,243, Cl. 73-119.00A.
Varner, Horace M., to United States of America, Interior. Articulated, flexible shaft assembly with axially lockable universal joint. 4,141,225, Cl. 64-2.00P.
Vartanian, Haig, to NRC, Inc. Tantalum powder reclaiming. 4,141,720, Cl. 75-0.5BB.
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Vent-Cair, Inc.: *See—*
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Vidal, Henri C. Terraced dwellings. 4,141,184, Cl. 52-169.400.
ViPond, Clyde M., to Ideal Industire, Inc. Wire cutter. 4,141,141, Cl. 30-186.000.
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Walker, Thad O.; and Warren, Kenneth W., to Texaco Inc. Drilling fluids containing polyethoxylated, sulfurized fatty alcohols. 4,141,840, Cl. 252-8.50C.
Wall, Harlin J., to Leisure Life, Inc. Frame structure for casting concrete. 4,141,532, Cl. 249-94.000.
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Walzer, James L., to Caterpillar Tractor Co. Control module with override mechanism. 4,141,258, Cl. 74-540.000.
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Ward, Charles R.; and Reilly, Robert A., to International Telephone & Telegraph Corp. Agile code generator. 4,142,240, Cl. 364-717.000.
Ward, Gene R., to Minnesota Mining and Manufacturing Company. Platform rocking chair springs. 4,141,530, Cl. 248-629.000.
Ward, John S., to Eli Lilly and Company. N-(1,3,4-thiadiazol-2-yl)benzamides. 4,141,984, Cl. 424-270.000.
Wardlaw, Stephen C.; and Levine, Robert A., to Massey, James V., III. Standard for calibrating and/or verifying instrument accuracy. 4,141,654, Cl. 356-243.000.
Warnaka, Glenn E., to Lord Corporation. Sound absorbing structure. 4,141,433, Cl. 181-286.000.
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Waters, William A. Personal air conditioning unit. 4,141,083, Cl. 2-171.300.
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Watson, Roy O., to FMC Corporation. Overcenter door control device. 4,141,104, Cl. 16-65.000.
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Weber, Karl, to Singer Company, The. Thread tensioning apparatus for sewing machines. 4,141,306, Cl. 112-254.000.
Weber, Rudolf, to Fa. Weber Lichtsteuergerate KG. Circuit to eliminate DC bias. 4,142,110, Cl. 307-237.000.
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Weidner, Peter F., to Diehl GmbH & Co. Electronic ignition circuit. 4,141,298, Cl. 102-210.000.
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Whipple, John N.; Moyer, Norman E.; and Merles, Irving B., to Hughes Aircraft Company. Digitally tuned timepiece. 4,141,208, Cl. 58-23.0AC.
White, Dwain M.; and Matthews, Robert O., to General Electric Company. Novel polyetherimide-polyester blends. 4,141,927, Cl. 260-857.0PA.
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Widegren, Lars H.; and Keskitalo, Tage O., to Elektro-Diesel, Firma. Method and apparatus for severing tree roots and felling trees. 4,141,398, Cl. 144-309.0AC.
Wiedemann, Otto; and Sedlmeier, Josef, to Wacker-Chemie GmbH. Process for the optimization of the manufacture of phthalic acid anhydride. 4,141,909, Cl. 260-346.400.
Wieland, Kurt H.; Noe, James C.; and Emerson, Terence P., to Garrett Corporation, The. Dual or multistream turbine. 4,141,672, Cl. 415-202.000.
Wiesner, Wolfgang, to Siemens Aktiengesellschaft. Stepping motor control circuit. 4,142,140, Cl. 318-696.000.
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Wilson, Nicol S.; Hunter, Gary L.; and Gay, Derek J., to Mattel, Inc. Two-speed inertia motor. 4,141,256, Cl. 74-64.000.
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Wolber, William G., to Bendix Corporation, The. Closed loop control system for hydrogen fuelled engine. 4,141,326, Cl. 123-119.0EC.
Wolf, Hans. Vibration damper. 4,141,527, Cl. 248-562.000.
Wolf, Johann, to Johann Wolf Gesellschaft m.b.H. KG. Animal feeding installation. 4,141,321, Cl. 119-51.00R.
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Wonderling, Harold J., to Air Preheater Company, Inc., The. Filter bag cage. 4,141,128, Cl. 29-163.50F.
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Wu, David H., to Sperry Rand Corporation. Method of enhancing the performance of lip-type shaft seals. 4,141,562, Cl. 277-1.000.
Wu, David H., to Sperry Rand Corporation. Power transmission. 4,141,563, Cl. 277-152.000.
Wukovich, Nick, to Foseco Trading AG. Breaker cores. 4,141,406, Cl. 164-359.000.
Wurster, Helmut, to Richard Wolf GmbH. Laser endoscope. 4,141,362, Cl. 128-303.100.

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Yamaguchi, Shigehiro; and Kobayashi, Hisashi, to Nippon Steel Corporation. Two-phase stainless steel. 4,141,762, Cl. 148-37.000.
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Yamasaki, Ikutaro, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Process for tracking a welded joint in a continuous long material in a production line. 4,142,237, Cl. 364-469.000.
Yamazaki, Masaru; Okusho, Susumu; and Anami, Takayuki, to Olympus Optical Company Limited. Apparatus for controlling facsimile transmitter and receiver. 4,142,214, Cl. 358-257.000.
Yanagisawa, Mitsuo, to Pearl Musical Instrument Co. Tom-tom holder. 4,141,272, Cl. 84-421.000.
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Yu, Ruey J.; and Van Scott, Eugene J. Treatment of psoriasis with 6-substituted nicotinamides, 2-substituted pyrazinamides and closely related compounds. 4,141,977, Cl. 424-250.000.
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Zabor, Eric R., to Owens-Illinois, Inc. Automatic parison freeze for a glassware forming machine. 4,141,711, Cl. 65-29.000.
Zaharia, Sidney D., to Beech Aircraft Corporation. Fuel-air type bomb. 4,141,294, Cl. 102-6.000.
Zalonis, Victor J. Snap swivel for fishing tackle. 4,141,116, Cl. 24-73.0HR.
Zelichenko, Faina S., administrator: *See*—
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Zetting, Alois; and Kopfli, Markus, to Cerberus AG. Method and apparatus for monitoring sound-conducting media. 4,142,188, Cl. 340-558.000.
Zettler, William D.; Woytych, Edward F.; Seichter, Daniel J.; and Schmidt, Frederick L., to Giddings & Lewis, Inc. Tool changer attachment for multi-function machine tools. 4,141,134, Cl. 29-568.000.
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Ziemke, William H.; and Glabe, Elmer F., to Ziemke, William H. Baking ingredient for sourdough compositions. 4,141,998, Cl. 426-99.000.
Zijlstra, Jan G. H., to AHI Operations Limited. Water taps. 4,141,384, Cl. 137-883.000.
Zimmerman, Dennis M., to Eli Lilly and Company. Decahydrocyclopent[c]azepines. 4,141,893, Cl. 260-239.0BB.
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Baldwin, James F. High temperature alloys. Re. 29,920, Cl. 75-134.00F.

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Sampson, Sidney O. Track selection control means for magnetic signal recording and reproducing systems. Re. 29,922, Cl. 360-63.000.

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Johnson, Harold A., Jr., 4,386, Cl. 48.000.
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Forde, Harold I., to University of California, The Regents of the. Walnut tree. 4,388, 2-27-79, Cl. 32.000.

Forde, Harold I., to University of California, The Regents of the. Walnut tree. 4,389, 2-27-79, Cl. 32.000.

Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 4,386, 2-27-79, Cl. 48.000.

Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 4,387, 2-27-79, Cl. 48.000.

McGredy, Samuel D. Rose plant. 4,385, 2-27-79, Cl. 7.000.

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Forde, Harold I., 4,388, Cl. 32.000.
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Conrad, Robert J. Combined aquarium and bird cage. 251,206, 2-27-79, Cl. D30-11.000.

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Lewis, Barbara. Reversible baking dish. 251,176, 2-27-79, Cl. D7-87.000.
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711 4,141,190
715 4,141,191
749 4,141,192

CLASS 53

412 4,141,195
529 4,141,193
4,141,194
550 4,141,196

CLASS 54

1 4,141,197
46 4,141,198
80 4,141,199

CLASS 55

5 4,141,697
6 4,141,698
17 4,141,699
90 4,141,701
94 4,141,702
316 4,141,703
337 4,141,700
379 4,141,704
394 4,141,705
437 4,141,706

CLASS 56

10.2 4,141,200
121.42 4,141,201
295 4,141,202
328 R 4,141,203
330 4,141,204

CLASS 57

58.32 4,141,205
243 4,141,207
290 4,141,206

CLASS 58

23 A 4,141,209
23 AC 4,141,208
23 D 4,141,210

CLASS 59

16 4,141,211

CLASS 60

39.16 R 4,141,212
39.67 4,141,213
276 4,141,214
398 4,141,215
454 4,141,216
641 4,141,218
645 4,141,219
698 4,141,220

CLASS 62

9 4,141,707
117 4,141,708
179 4,141,222
469 4,141,223
514 R 4,141,224

CLASS 64

2 P 4,141,225
17 R 4,141,226

CLASS 65

2 4,141,709
3 A 4,141,710
29 4,141,711
36 4,141,712
182 R 4,141,713

CLASS 66

75.1 4,141,228
171 4,141,229
204 4,141,230
229 4,141,227

CLASS 68

205 R 4,141,231

CLASS 70

54 4,141,232
232 4,141,233
350 4,141,234

CLASS 71

27 4,141,714
58 4,141,715
90 4,141,716
4,141,717
95 4,141,718

CLASS 72

213 4,141,235

CLASS 73

11 4,141,236
23.1 4,141,237
28 4,141,238
81 4,141,239
114 4,141,240
117.3 4,141,241
4,141,242
119 A 4,141,243
133 R 4,141,244
144 4,141,245
194 B 4,141,246
363.5 4,141,247
379 4,141,248
423 R 4,141,249
425.6 4,141,250
4,141,251
724 4,141,252
727 4,141,253

CLASS 74

10.33 4,141,254
25 4,141,255
64 4,141,256
529 4,141,257
540 4,141,258
674 4,141,259

CLASS 75

0.5 BB 4,141,719
4,141,720
14 4,141,721
24 4,141,722
60 4,141,723
126 D 4,141,724
134 F Re.29,920
146 4,141,725
229 4,141,726
232 4,141,727

CLASS 76

25 R 4,141,260

CLASS 81

57.11 4,141,261
57.39 4,141,262

CLASS 82

45 4,141,263

CLASS 83

23 4,141,264
169 4,141,265
337 4,141,266
712 4,141,267

CLASS 84

1.03 4,141,268
1.22 4,141,269
1.24 4,141,270
312 P 4,141,271
421 4,141,272
484 4,141,273

CLASS 89

1.5 R 4,141,274
1.703 4,141,275
11 4,141,276
38 4,141,277

CLASS 90

11 C 4,141,279
11 R 4,141,278

CLASS 91

29 4,141,280
216 R 4,141,281
374 4,141,282
461 4,141,283
532 4,141,284

CLASS 96

1.4 4,141,728
1.5 R 4,141,729
9 4,141,730
35.1 4,141,731
41 4,141,732
49 4,141,733
53 4,141,734
75 4,141,735
87 R 4,141,736

CLASS 98

115 R 4,141,285

CLASS 99

285 4,141,286
450.1 4,141,287

CLASS 100

35 4,141,288
212 4,141,289

CLASS 101

93.48 4,141,290
99 4,141,291
125 4,141,292
181 4,141,293

CLASS 102

6 4,141,294
10 4,141,295
24 R 4,141,296
206 4,141,297
210 4,141,298

CLASS 105

260 4,141,299
368 S 4,141,300

CLASS 106

12 4,141,737
39.6 4,141,738
4,141,739
44 4,141,740
47 Q 4,141,741
47 R 4,141,742
66 4,141,743
105 4,141,744
146 4,141,745
164 4,141,749
169 4,141,746
210 4,141,747
212 4,141,748
218 4,141,750
308 Q 4,141,751

CLASS 111

7 4,141,301
52 4,141,302

CLASS 112

79 R 4,141,303
153 4,141,304
158 E 4,141,305
254 4,141,306
292 4,141,307

CLASS 114

270 4,141,308

CLASS 115

70 4,141,309

CLASS 116

227 4,141,311

CLASS 118

7 4,141,312
212 4,141,313
246 4,141,314
303 4,141,316
420 4,141,315
661 4,141,317

CLASS 119

3 4,141,318
14.47 4,141,319
37 4,141,320
51 R 4,141,321
106 4,141,322

CLASS 123

25 B 4,141,323
32 R 4,141,324
90.3 4,141,325
119 EC 4,141,326
122 F 4,141,327
138 4,141,328
139 AW 4,141,330
139 B 4,141,329
148 CC 4,141,331
148 R 4,141,332
198 E 4,141,334
198 F 4,141,333

CLASS 126

111 4,141,335
121 4,141,336
270 4,141,337
4,141,338
4,141,339
271 4,141,340
4,141,341
299 D 4,141,342
360 A 4,141,343

CLASS 128

1 C 4,141,344
2 A 4,141,348
2 S 4,141,345
4,141,349
2 T 4,141,346
2 V 4,141,347
2.05 S 4,141,350
2.06 R 4,141,351
62 A 4,141,352
87 B 4,141,368
142 R 4,141,353
145.6 4,141,354
4,141,355
145.8 4,141,356
159 4,141,357
166 4,141,358
172.1 4,141,359
276 4,141,360
278 4,141,361
303.1 4,141,362
335 4,141,363
349 B 4,141,364
404 4,141,365
418 4,141,366
419 P 4,141,752
419 PT 4,141,367

CLASS 131

171 A 4,141,369

CLASS 132

39 4,141,370
40 4,141,371

CLASS 133

1 R 4,141,372

CLASS 134

8 4,141,753
21 4,141,373
24 4,141,754
42 4,141,755
46 4,141,374

CLASS 135

66 4,141,375

CLASS 137

83 4,141,376
236 4,141,377
315 4,141,378
496 4,141,379
513.5 4,141,380
527.2 4,141,381
596.15 4,141,382
606 4,141,383
883 4,141,384

CLASS 138

122 4,141,385
147 4,141,386
158 4,141,387

CLASS 139

383 A 4,141,388

CLASS 140

93 A 4,141,389

CLASS 141

9 4,141,390
59 4,141,391
98 4,141,392
206 4,141,393
284 4,141,394

CLASS 144

193 A 4,141,396
193 R 4,141,395
209 R 4,141,397
309 AC 4,141,398

CLASS 148

1.5 4,141,756
4,141,757
6.2 4,141,758
6.35 4,141,759
31.5 4,141,760
36 4,141,761
37 4,141,762
105 4,141,763
174 4,141,764
175 4,141,765

CLASS 149

2 4,141,766
4,141,767
19.3 4,141,768
40 4,141,769

CLASS 150

31 4,141,399
39 4,141,400
52 R 4,141,401

CLASS 156

218 4,141,770
222 4,141,771
227 4,141,772
244.15 4,141,773
309 4,141,774
358 4,141,775
502 4,141,776
606 4,141,777
613 4,141,778
617 SP 4,141,779
626 4,141,780
637 4,141,781
643 4,141,782

CLASS 159

4 S 4,141,783

CLASS 160

176 R 4,141,402
201 4,141,403

CLASS 162

17 4,141,784
36 4,141,785
40 4,141,786
42 4,141,787
125 4,141,788
272 4,141,789

CLASS 164

4 4,141,404
46 4,141,405
161 Re.29,919
359 4,141,406

CLASS 163

12 4,141,407
29 4,141,408
110 4,141,409
113 4,141,410
151 4,141,411
166 4,141,412

CLASS 166

120 4,141,413
212 4,141,414
252 4,141,415
270 4,141,416
305 R 4,141,417
324 4,141,418

CLASS 172

1 4,141,419
59 4,141,420

CLASS 174

153 G 4,142,064

CLASS 175

263 4,141,421

CLASS 178

69.1 4,142,065

CLASS 179

1 P 4,142,066
1 SC 4,142,067
15 AT 4,142,068
15 BS 4,142,069
4,142,070
15.55 R 4,142,071
107 FD 4,142,072
111 E 4,142,073
124 4,142,074
170 NC 4,142,075

CLASS 180

1 F 4,141,422
9.6 4,141,423
53 CD 4,141,424
65 DD 4,141,425
68 R 4,141,426
69 R 4,141,427
70 P 4,141,428
89.14 4,141,429
105 E 4,141,430
148 4,141,432

CLASS 181

118 4,141,431
286 4,141,433

CLASS 184

6.12 4,141,434

CLASS 187

29 R 4,141,435

CLASS 188

71.1 4,141,436
340 4,141,437

CLASS 191

12.4 4,141,438

CLASS 192

18 R 4,141,439
53 F 4,141,440
70.25 4,141,441

CLASS 195

29 4,141,790
66 R 4,141,791
99 4,141,792

CLASS 198

429 4,141,442
471 4,141,443
472 4,141,444

CLASS 200

4 4,142,076
19 A 4,142,077
48 R 4,142,078
84 C 4,142,079
86.5 4,142,080
251 4,142,081

CLASS 201

6 4,141,793
12 4,141,794
39 4,141,795
4,141,796
41 4,141,797

CLASS 202

234 4,141,798

CLASS 203

48 4,141,799

CLASS 204

1 T 4,141,800
2.1 4,141,801
15 4,141,802
51 4,141,803
105 R 4,141,804
157.1 H 4,141,805
159.22 4,141,806
159.23 4,141,807
159.24 4,141,808
180 R 4,141,809
181 C 4,141,810
192 E 4,141,811
195 S 4,141,812
4,141,813
252 4,141,814
290 F 4,141,815

CLASS 206

228 4,141,445
387 4,141,446
392 4,141,447
485 4,141,448
621 4,141,449

CLASS 208

107 4,141,816
139 4,141,817
177 4,141,818
206 4,141,819
251 H 4,141,820

CLASS 209

3.1 4,141,450
405 4,141,821
664 4,141,451

CLASS 210

6 4,141,822
17 4,141,823
4,141,824
23 H 4,141,825
26 4,141,826
54 4,141,827
63 R 4,141,828
4,141,829
63 Z 4,141,830
195 S 4,141,831
4,141,832
198 C 4,141,833
241 4,141,834
321 A 4,141,835
365 4,141,837
498 4,141,838
512 M 4,141,839

CLASS 211

60 T 4,141,452
163 4,141,453

CLASS 212

8 R 4,141,454
55 4,141,455

CLASS 214

1 BV 4,141,457
1 R 4,141,456
301 4,141,458

CLASS 219

10.55 B 4,142,082
58 4,142,083
60 A 4,142,084
61 4,142,085
75 4,142,086
90 4,142,087
121 L 4,142,088
121 P 4,142,089
4,142,090
130.1 4,142,091
218 4,142,092
301 4,142,093
524 4,142,094

CLASS 220

85 K 4,141,459
88 A 4,141,460
253 4,141,461
254 4,141,462
267 4,141,464
359 4,141,463
445 4,141,465
462 4,141,466

CLASS 222

38 4,141,467
105 4,141,468
135 4,141,469
137 4,141,470
182 4,141,471
189 4,141,472
473 4,141,473
493 4,141,474
494 4,141,475
505 4,141,476
569 4,141,477
600 4,141,478

CLASS 225

38 4,141,479

CLASS 226

25 4,141,480

CLASS 228

145 4,141,481
158 4,141,482
193 4,141,483
265 4,141,484

CLASS 229

17 SC 4,141,485
23 C 4,141,486
43 4,141,487

CLASS 233

7 4,141,488
26 4,141,489

CLASS 234

115 4,141,491

CLASS 235

54 F 4,142,095
92 EA 4,142,096
382 4,142,097
437 4,141,492
448 4,141,493
449 4,141,494

CLASS 236

1 G 4,141,495
49 4,141,496
51 4,141,497

CLASS 237

1 A 4,141,498
2 B 4,141,490

CLASS 238

25 4,141,499
304 4,141,500

CLASS 239

265.39 4,141,501
381 4,141,502
394 4,141,503
4,141,504
431 4,141,505
456 4,141,506
590.5 4,141,507
664 4,141,508

CLASS 241

30 4,141,509
46 A 4,141,510
183 4,141,511
194 4,141,512

CLASS 242

18 A 4,141,513
4,141,514
54 R 4,141,515
55.53 4,141,516
68.3 4,141,517
107.4 A 4,141,518
137.1 4,141,519

CLASS 244

83 A 4,141,520
155 R 4,141,521
186 4,141,522

CLASS 248

70 4,141,524
251 4,141,525
352 4,141,526
359 4,141,529
560 4,141,528
562 4,141,527
629 4,141,530
653 4,141,523

CLASS 249

80 4,141,531
94 4,141,532

CLASS 250

201 4,142,098
308 4,142,099
315 A 4,142,100
363 R 4,142,101
369 4,142,102
409 4,142,103
436 4,141,686
548 4,142,105
559 4,142,106
571 4,142,107

CLASS 251

,58 4,141,533
4,144,534
144 4,141,535
161 4,141,536
306 4,141,537
315 4,141,538

CLASS 252

8.5 C 4,141,840
8.55 D 4,141,842
8.55 R 4,141,843
8.8 4,141,841
46.7 4,141,844
4,141,845
48.2 4,141,846
51.5 A 4,141,847
4,141,848
62.1 P 4,141,849
78.3 4,141,851
79.4 4,141,850
182 4,141,852
299 4,141,853
301.1 W 4,141,854
301.4 R 4,141,855
408 4,141,856
430 4,141,857
439 4,141,858
455 Z 4,141,859
4,141,860
462 4,141,861

CLASS 260

3 4,141,863
17.4 SG 4,141,864
18 EP 4,141,865
23 AR 4,141,867
4,141,868
23 XA 4,141,866
29.15 B 4,141,869
29.4 R 4,141,871
4,141,872
29.4 UA 4,141,870
29.6 F 4,141,873
4,141,874
29.7 E 4,141,875
33.6 AQ 4,141,878
33.6 UA 4,141,876
37 EP 4,141,877
37 N 4,141,879
4,141,880
40 P 4,141,881
40 R 4,141,882
45.8 N 4,141,883
4,141,884
112 B 4,141,887
123.7 4,141,888
144 4,141,889
153 4,141,890
155 4,141,891
186 4,141,892
239 BB 4,141,893
4,141,894
239.3 A 4,141,896
239.3 D 4,141,895
308 A 4,141,900
308 B 4,141,903
308 R 4,141,901
4,141,902
314.5 4,141,904
326.5 FM 4,141,905
340.5 R 4,141,906
340.9 R 4,141,908
345.7 R 4,141,907
346.4 4,141,909
349 4,141,910
438.5 R 4,141,911
453 P 4,141,913
458 C 4,141,912
464 4,141,914
465 D 4,141,915
536 AR 4,141,916
580 4,141,917
590 C 4,141,918
594 4,141,919
607 B 4,141,920
652 P 4,141,922
673.5 4,141,923
674 R 4,141,924
681.5 C 4,141,925
824 EP 4,141,926
857 PA 4,141,927
860 4,141,928
862 4,141,929
876 R 4,141,931
880 R 4,141,932
4,141,933
881 4,141,934
885 4,141,935
897 C 4,141,936
927 N 4,141,937
928 4,141,938

CLASS 261

1 4,141,939
23 A 4,141,940

CLASS 264

1 4,141,941
9 4,141,942
24 4,141,943
45.5 4,141,944
63 4,141,945
69 4,141,946
75 4,141,947
101 4,141,948
134 4,141,949
138 4,141,950
230 4,141,951
251 4,141,952
340 4,141,953

CLASS 266

78 4,141,539
276 4,141,540

CLASS 269

6 4,141,541
88 4,141,542
228 4,141,543

CLASS 270

86 4,141,544

CLASS 271

118 4,141,545
173 4,141,546

CLASS 273

1 E 4,141,548
29 A 4,141,549
4,141,550
73 G 4,141,551
86 B 4,141,552
4,141,553
106.5 R 4,141,554
139 4,141,555
164 4,141,556
181 A 4,141,557
201 4,141,558
220 4,141,559
244 4,141,560
271 4,141,561

CLASS 277

1 4,141,562
80 4,141,547
152 4,141,563

CLASS 279

4 4,141,564

CLASS 280

11.37 A 4,141,565
16 4,141,566
289 G 4,141,567
415 B 4,141,568
507 4,141,569
607 4,141,570
620 4,141,571
707 4,141,572
744 4,141,573

CLASS 285

92 4,141,574
305 4,141,575
369 4,141,576
382.2 4,141,577

CLASS 290

1 R 4,142,108

CLASS 294

61 4,141,578
4,141,579

CLASS 296

1 S 4,141,580
39 R 4,141,581
50 4,141,582
65 R 4,141,583

CLASS 297

41 4,141,584
180 4,141,585
191 4,141,586
195 4,141,587
258 4,141,588
397 4,141,589
440 4,141,590

CLASS 298

17.6 4,141,591

CLASS 299

16 4,141,592
34 4,141,593
43 4,141,594

CLASS 303

10 4,141,595
24 C 4,141,596
119 4,141,597

CLASS 305

28 4,141,598
35 R 4,141,599
36 4,141,600
54 4,141,601
57 4,141,602

CLASS 307

221 D 4,142,109
237 4,142,110
238 4,142,112
270 4,142,113
304 4,142,114
315 4,142,115
350 4,142,116
353 4,142,117
358 4,142,118

CLASS 308

9 4,141,603
10 4,141,604
26 4,141,605
140 4,141,606
200 4,141,607

CLASS 310

46 4,142,119
59 4,142,120
316 4,141,608
360 4,142,124

CLASS 312

1 4,141,609
114 4,141,610
116 4,141,611
245 4,141,612

CLASS 313

131 A 4,142,121
220 4,142,122
400 4,142,123
485 4,142,125
497 4,142,126

CLASS 314

105 4,142,127

CLASS 315

15 4,142,128
89 4,142,129
188 4,142,130
368 4,142,131
370 4,142,132
382 4,142,133
387 4,142,134

CLASS 318

139 4,142,135
283 4,142,137
542 4,142,138

603 4,142,139
696 4,142,140
779 4,142,136

CLASS 322

28 4,141,613

CLASS 323

6 4,142,141

CLASS 324

51 4,142,143
54 4,142,142
61 R 4,142,144
62 4,142,145
77 A 4,142,146
79 R 4,142,147
140 R 4,142,148
157 4,142,149
158 D 4,142,151
158 T 4,142,150
165 4,142,152
- 4,142,153
219 4,142,154

CLASS 325

47 4,142,155
309 4,142,156
464 4,142,157
4,142,158

CLASS 328

120 4,142,159

CLASS 331

94.5 H 4,142,160
116 R 4,142,161

CLASS 332

31 T 4,142,162

CLASS 333

72 4,142,163
73 W 4,142,164

CLASS 335

81 4,142,166
190 4,142,167
207 4,142,168
243 4,142,169

CLASS 338

28 4,142,170

CLASS 339

17 F 4,141,614
36 4,141,615
75 M 4,141,616
97 L 4,141,617
97 P 4,141,618
267 4,141,619

CLASS 340

12 R 4,142,171
81 R 4,142,172
119 4,142,173
146.1 AL 4,142,174
146.3 SY 4,142,175
166 R 4,142,176
171 R 4,142,177
310 R 4,142,178

321 4,142,179
347 AD 4,142,185
347 DA 4,142,184
388 4,142,186
554 4,142,187
558 4,142,188
706 4,142,183
709 4,142,180
765 4,142,182
781 4,142,181

CLASS 343

9 4,142,189
700 MS 4,142,190

CLASS 346

76 L 4,142,191
153 4,142,192

CLASS 350

6.8 4,141,620
96.12 4,141,621
96.23 4,141,622
4,141,623
96.26 4,141,624
171 4,141,625
295 4,141,626
349 4,141,627

CLASS 351

111 4,141,628

CLASS 352

27 4,141,629
132 4,141,630

CLASS 353

116 4,141,631

CLASS 354

14 4,141,632
24 4,141,633
154 4,141,634
173 4,141,635
196 4,141,636
219 4,141,637
246 4,141,638
289 4,141,639
300 4,141,640
313 4,142,193
318 4,142,194

CLASS 355

1 4,141,641
4,141,642
3 CH 4,141,644
3 DD 4,141,643
4,141,645
10 4,141,646
4,141,647
14 4,141,648
4,142,165
35 C 4,141,650
51 4,141,649

CLASS 356

121 4,141,652
243 4,141,654
350 4,141,651

419 4,141,653

CLASS 357

15 4,142,195
17 4,142,196
23 4,142,197
24 4,142,198
4,142,199
30 4,142,200
38 4,142,201
71 4,142,202
80 4,142,203

CLASS 358

2 4,142,204
13 4,142,205
113 4,142,206
4,142,207
127 4,142,208
128 4,142,209
4,142,210
167 4,142,211
213 4,142,212
221 4,142,213
257 4,142,214

CLASS 360

31 4,142,215
63 Re.29,922
72 4,142,216
90 4,142,217
113 4,142,218

CLASS 361

18 4,142,219
120 4,142,220
151 4,142,221
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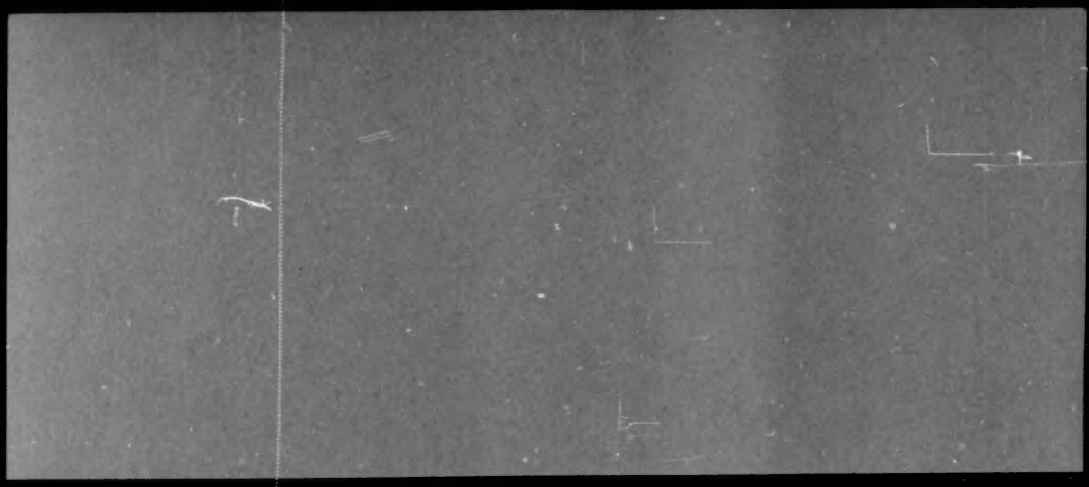

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